UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
TYLER DIVISION

ERICSSON INC., et al.

Plaintiffs

v.

D-LINK CORPORATION, et al.

Defendants.

Civil Action No. 6:10-cv-473

JURY TRIAL DEMANDED

DEFENDANTS' PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW WITH CITATION TO AUTHORITY FOR ISSUES TRIED TO THE BENCH

Pursuant to Federal Rule of Civil Procedure 52, Defendants present their Proposed Findings Of Fact And Conclusions Of Law Regarding Defendants' RAND, breach of contract, promissory estoppel, laches and unclean hands defenses.

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FINDINGS OF FACT

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I. INTRODUCTION

1. Intel Corporation ("Intel"), Acer, Inc., Acer America Corporation and Gateway Inc. (an Acer subsidiary) (together "Acer"), Belkin International, Inc. ("Belkin"), D-Link Systems, Inc. ("D-Link"), Dell Inc. ("Dell"), NETGEAR, Inc. ("NETGEAR"), Toshiba Corporation and Toshiba America Information Systems, Inc. (together "Toshiba") (all these parties collectively referred to herein as "Defendants") submit these Findings of Fact and Conclusions of Law in support of their claims for breach of contract, promissory estoppel, unclean hands, and laches. Defendants bring these claims, *inter alia*, because Plaintiffs Telefonaktiebolaget LM Ericsson and Ericsson Inc. (collectively "Ericsson") are engaging in unreasonable and highly discriminatory licensing practices in violation of Ericsson's obligations to license its patents on reasonable and non-discriminatory (RAND) terms, including by seeking to impose unreasonable and discriminatory royalty rates on Defendants.

2. In setting its proposed rates, Ericsson disregards established damages and RAND principles, and proposes a rate of up to 88 cents per unit when the accused Wi-Fi chipsets currently sell on average for less than $2. Such rates would constitute in many cases an unjustifiable 50% or greater royalty when applied to Wi-Fi chipsets. If imposed, Ericsson's proposed rate would threaten the viability of Wi-Fi chipset products, as the cost of a single license from Ericsson (let alone other patent holders who may try to follow suit) would make them too expensive to produce and sell.

3. For these reasons, defendants request that the Court set a RAND rate for Ericsson's patents that it claims are essential to the IEEE 802.11 Wi-Fi standard, and find that Ericsson's licensing practices violate Ericsson's RAND obligations. Such an approach was

recently adopted by Judge James Robart in *Microsoft Corp. v. Motorola, Inc., et al.*, No. 2:10-cv-01823, Dkt. No. 680, ¶ 308 (Apr. 25, 2013). In *Microsoft,* Judge Robart held a bench trial on RAND issues in connection with Microsoft's claim that Motorola violated its RAND obligations in connection with its attempts to license the same standardized Wi-Fi technology at issue in this case.[1] In applying RAND principles, Judge Robart found the range of RAND rates for Wi-Fi technology to be between 0.8 cents and 19.5 cents per unit, and ultimately determined that the rate for Motorola's alleged 802.11 essential patents — numbering more than asserted against Defendants here was 3.5 cents per unit. By contrast, Ericsson's proposed rate for its alleged 802.11 essential patents vastly exceeds these amounts. Ericsson's proposed rate is many times more than even the upper bound of this range, and more than 50 times the lower bound. Moreover, Ericsson's approach to determining its proposed royalty is inconsistent with accepted approaches for determining RAND rates, as confirmed in *Microsoft*. Accordingly, as in *Microsoft,* Defendants request that the Court intervene to confirm Ericsson's licensing obligations and the proper RAND rates for the accused Wi-Fi products, and prevent Ericsson from further violations of its RAND commitments.

II. THE PARTIES

4. Plaintiff Ericsson Inc. is a corporation headquartered in Plano, Texas. Ericsson Inc. is a wholly-owned subsidiary of Plaintiff Telefonaktiebolaget LM Ericsson, a Swedish company headquartered in Stockholm, Sweden.

5. Intervenor and counterclaim defendant Intel, a company headquartered in Santa Clara, California, is the largest semiconductor manufacturer in the world. Among other things, Intel offers microprocessors, chipsets, system-on-chip products, and wireless connectivity

[1] *Microsoft Corp. v. Motorola, Inc., et al.*, No. 2:10-cv-01823, Dkt. No. 680, at 2 (Apr. 25, 2013)

products, like IEEE 802.11 "Wi-Fi" chip components that it supplies to other companies, including some of the defendants in this case, for inclusion in end products like laptop computers.

6. Defendant Acer, Inc. is a manufacturer of numerous products that incorporate Wi-Fi chip components, including notebook and desktop PCs, servers and storage, LCD monitors, projectors, and tablets. Headquartered in Taiwan, Acer, Inc.'s US headquarters are in San Jose, California, where its wholly-owned subsidiary, Acer America Corporation, is located. Acer, Inc. acquired Gateway, Inc. —a company based in Irvine, California—in October 2007.

7. Defendant Belkin is a privately held company headquartered in Playa Vista, California, that offers consumer technology products and networking products that incorporate Wi-Fi chip components, including wireless access points and routers, powerline, and home theatre solutions.

8. Defendant D-Link provides services to small and medium-sized business for technologies in wireless, switching, IP surveillance, network storage, and security. Their home products include routers, switches, network adapters, access points, range extenders and bridges, KVM switches, powerline, modems, print servers, USB hubs, MoCA, network cameras, network video recorders, share center, media players, and wireless mobile broadband. D-Link is based in Fountain Valley, California.

9. Defendant Dell, headquartered in Round Rock, Texas, develops, manufactures, markets, sells, and supports mobility and desktop products that incorporate Wi-Fi chip components, including notebooks, workstations, tablets, and desktop PCs. The company also offers, among other things, networking and wireless products.

10. Defendant NETGEAR focuses on network products that incorporate Wi-Fi chip components for use in small and medium businesses, and homes, such products including hubs, switches, secured wired and wireless routers, gateways, modems, adapters, access points and antennas. NETGEAR is headquartered in San Jose, California.

11. Defendant Toshiba Corporation, headquartered in Tokyo, Japan, is a worldwide leader in various electronic and electric products. Toshiba Corporations develops products, such as laptops, that incorporate Wi-Fi chip components. Toshiba America Information Systems, Inc. ("TAIS"), headquartered in Irvine, California, is a wholly-owned subsidiary whose ultimate parent corporation is Toshiba Corporation. TAIS sells Toshiba-branded products, such as laptops, in the U.S. market.

III. STANDARD-SETTING ORGANIZATIONS

12. This case involves technology that is part of a standard, specifically wireless local area network (WLAN) technology based on the IEEE 802.11 standard, which is commonly referred to as "Wi-Fi." *See Microsoft*, No. 2:10-cv-01823, Dkt. No. 680, ¶ 308.

13. Wi-Fi stands for "wireless fidelity" and is the trademarked name used by the Wi-Fi Alliance to signify WLAN interoperability among certified products.[2]

14. Ericsson claims to hold a number of patents that are alleged to be essential to the Wi-Fi standard, and claims infringement against Defendants' products that operate in accordance with IEEE 802.11n.[3]

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[2] Wireless Ethernet LAN (WLAN): General 802.11a/802.11b/802.11g FAQ. Intel Corporation, (n.d.), http://download.intel.com/support/wireless/wlan/sb/wirelesslanfaq.pdf.

[3] 802.11n is an amendment to the 802.11 standard, but will be referred to herein as the 802.11n standard. As noted elsewhere, there are numerous amendments that have been made to the 802.11 standard over time, including 802.11a, b, g, n, and soon 802.11ac is expected.

15. A technical standard, such as IEEE 802.11, is a widely adopted solution typically defined in a formal document developed or published by a standard-setting organization ("SSO").

16. A standard is "any set of technical specifications that either does or is intended to provide a common design for a product or process."[4] These specifications are designed to ensure the functionality and reliability of products, as well as facilitate interoperability.[5]

17. Standard setting efforts usually arise when there are multiple technological alternatives available for an emerging or evolving product in a competitive market. Firms that are interested in developing or defining a standard can choose to collaborate in standard setting efforts by voluntarily participating in an SSO for that application. Typically, SSOs then form working groups comprised of representatives from member firms (or their individual delegates and employee representatives) to test, evaluate, or develop potential technical options from which one or more are selected to finalize the standard.

18. Member firms often make substantial investments in the standard by contributing their valuable intellectual property through technical proposals submitted by their employee representatives. However, these companies are rewarded for their disclosures by, among other things, the expansion of the market for their intellectual property and/or products.[6]

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4 Lemley, Mark A., Intellectual Property Rights and Standard-Setting Organizations, *California Law Review*, Vol. 90 (2002), p. 1896 (75753DOC000292).

5 *Microsoft*, No. 2:10-cv-01823, Dkt. No. 680 ¶¶ 10-11; What Are Standards?, IEEE Standards Association, (n.d.), http://standards.ieee.org/develop/overview.html (75753DOC002970).

6 *See Microsoft*, No. 2:10-cv-01823, Dkt. No. 680 ¶¶ 12-14; Chapter 2: Competition Concerns When Patents are Incorporated into Collaboratively Set Standards, *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition*, U.S. Department of Justice & Federal Trade Commission, April 2007, p. 33-34 (75753DOC001140); Ericsson Submission On FRAND and SEP Litigation, Submission to the ITU, October 10, 2012 (75755DOC000055); Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party,

19. Overall, standards increase competition and enhance consumer welfare.[7] Successfully established standards benefit stakeholders in an emerging technology by providing interoperability (the ability of products from different manufacturers to function seamlessly together), promoting technology adoption, improving quality, reducing costs, and simplifying the innovation and product development process.[8] A well-established standard provides assurances to end users that compliant products will work together and increases users' ability to compare competing products by eliminating non-value added product differences.[9] In addition, since standards are usually globally adopted and applied in numerous markets, they have been called a "fundamental building block for international trade."[10] Standards can have significant procompetitive advantages.[11]

20. While a specific technology is being adopted and after it has been adopted, firms may make investments in time and financial resources to design, produce, and market products that incorporate or comply with the new standard. It is also likely that future technology advancements and innovations will tend to rely on the standard. It may be feasible to change

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Apple, Inc. v. Motorola Mobility, Inc., Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), *passim.*

7 *See Microsoft, No. 2:10-cv-01823, Dkt. No. 680, ¶¶ 13-15*; *Broadcom Corp. v. Qualcomm Inc.*, 501 F.3d 297, 302-322, at 309(3d Cir. 2007); Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party, *Apple, Inc. v. Motorola Mobility, Inc.*, Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), p. 2-5.

8 *Apple, Inc. v. Motorola Mobility, Inc.*, 2011 WL 7324582, at *1 (W.D. Wis. June 7, 2011).

9 Standards-Setting Practices: Competition, Innovation and Consumer Welfare, Testimony by Amy A. Marasco Vice President and General Counsel, American National Standards Institute (ANSI), before the Federal Trade Commission and Department of Justice, April 18, 2002, p. 3 (75753DOC001688).

10 Standards-Setting Practices: Competition, Innovation and Consumer Welfare, Testimony by Amy A. Marasco Vice President and General Counsel, American National Standards Institute (ANSI), before the Federal Trade Commission and Department of Justice, April 18, 2002, p. 3; What Are Standards?, IEEE Standards Association, (n.d.), http://standards.ieee.org/develop/overview.html (75753DOC002970).

11 *Allied Tube & Conduit Corp. v. Indian Head, Inc.*, 486 U.S. 492, 500-01 (1988).

technologies early in the standardization process. However, after most firms in a market incorporate an adopted technology standard into their products, the cost and difficulties associated with switching effectively "lock in" companies.[12]

21. This lock-in has the potential to create market power for owners of patents alleged to be essential to the standard after a standard is adopted.[13] Standard setting can create a competitive advantage and enhance the market value of a technology by reducing the number of acceptable close substitutes, even though the contribution of the particular patent or portion of the standard alleged to be covered by the patent may be minor in nature, have little value, and convey no particular advantage to its owner beforehand. The selection by a SSO of a proprietary technology can cause additional use of a particular technology due to the standard-setting process rather than the inherent characteristics of the invention.[14] The holder of a patent that is essential to a standard may seek to take advantage of investments in products and technology

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[12] *See Microsoft*, No. 2:10-cv-01823, Dkt. No. 680, ¶ 52; ERCDLINK0495903 at 912 ("Standardisation can eliminate inter-technology competition, and, in doing so, can give market power to patent holders who, absent standardization, would potentially be constrained."); Lim, Daryl, Misconduct in Standard Setting: The Case For Patent Misuse, ATRIP Essay Competition 2009, http://www.atrip.org/upload/files/essays/winners2009/Daryl%20Lim.pdf, p. 3 (75753DOC000401); Chapter 2: Competition Concerns When Patents are Incorporated into Collaboratively Set Standards, *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition*, U.S. Department of Justice & Federal Trade Commission, April 2007, p. 34-35; Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party, *Apple, Inc. v. Motorola Mobility, Inc.*, Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), p. 15, 21 (75753DOC001140).

[13] *See Microsoft*, No. 2:10-cv-01823, Dkt. No. 680, ¶¶ 55-61; Nelson, Philip B., Patent Pools: An Economic Assessment of Current Law and Policy, *Rutgers Law Journal*, Vol. 38:539, (2007), p. 544-45 (75753DOC000736); Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party, *Apple, Inc. v. Motorola Mobility, Inc.*, Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), p. 15.

[14] Nelson, Philip B., Patent Pools: An Economic Assessment of Current Law and Policy, *Rutgers Law Journal*, Vol. 38:539, (2007), p. 545 (75753DOC000736); Rapp, Richard T., and Lauren J. Stiroh, Standard Setting and Market Power, NERA, April, 18, 2002, p. 2 (75753DOC001673).

switching costs to demand more for a license than would have been agreed upon before the technology was adopted into a standard.[15] After a technology has been standardized, a "patent holder could seek to extract a higher payment than was attributable to the value of the patented technology before the standard was set."[16]

22. This problem has been referred to as patent hold-up, as one patent holder can disrupt the adoption and success of an entire standard.[17] A holder of a patent that is allegedly essential to a standard may be in a unique position with bargaining power that enables it to seek the extraction of supracompetitive royalties from implementers of the standard.[18] These supracompetitive royalties reflect far more than the *ex ante* value of the patent compared to

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[15] Maynard, Deanne E., Sean P. Gates, John Thorne, Gail F. Levine, Written Comments of Verizon Communications Inc. for Federal Trade Commission Workshop on Standard-Setting Issues, Patent Standards Workshop, Project No. P11 1204, August 5, 2011, p. 1 (75753DOC000582).

[16] Statement of Antitrust Division on Its Decision to Close Its Investigations of Google Inc.'s Acquisition of Motorola Mobility Holdings Inc. and the Acquisitions of Certain Patents by Apple Inc., Microsoft Corp. and Research In Motion Ltd., February 13, 2012, http://www.justice.gov/atr/public/press_releases/2012/280190.pdf (75755DOC001751; *Broadcom Corp.*, 501 F.3d at 308; *Research In Motion Ltd. v. Motorola, Inc.*, 644 F. Supp. 2d 788, 797 (N.D. Tex. 2008).

[17] Lemley, Mark A. and Carl Shapiro, Patent Holdup and Royalty Stacking, *Texas Law Review*. Vol. 85 (2007), p. 1993 (75755DOC2497); Maynard, Deanne E., Sean P. Gates, John Thorne, Gail F. Levine, Written Comments of Verizon Communications Inc. for Federal Trade Commission Workshop on Standard-Setting Issues, Patent Standards Workshop, Project No. P11 1204, August 5, 2011, p. 1 (75753DOC000582); The Evolving IP Marketplace: Aligning Patent Notice and Remedies With Competition, Federal Trade Commission, March 7, 2011, http://www.ftc.gov/os/2011/03/110307.pdf, p. 5, 7, 22 (75755DOC001861); Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party, *Apple, Inc. v. Motorola Mobility, Inc.*, Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), p. 15 ("Hold-up can be defined as the ability of the owner of patented technology to extract higher royalties 'after its technology has been chosen by the SSO as a standard and others have incurred sunk costs which effectively increase the relative cost of switching to an alternative standard.'").

[18] *Broadcom Corp. v. Qualcomm Inc.*, 501 F.3d 297, 310 (3d Cir. 2007); Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party, *Apple, Inc. v. Motorola Mobility, Inc.*, Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), p. 15-21.

alternatives, but also the value associated with, for example, implementation of the standard.[19] This enhancement is due more to the wide adoption of the standardized technology than to, in most cases, the value of any particular and discrete intellectual property incorporated in the standard.[20]

23. An *ex ante* valuation is more likely to reflect the incremental value offered by that technology relative to the next best alternative available prior to adoption of the standard, rather than an inflated value due to the elimination of practical alternatives through the standardization process, which can result from an *ex post* valuation. One of the primary purposes of setting standards is to allow consumers the benefits of compatibility in products and to encourage future innovation. Payments based on the value of standardization rather than the economic value of the patented technology can "deter innovation by increasing the costs and uncertainty of other innovators and by discouraging adoption of standards."[21] Patent hold-up "can overcompensate patentees, raise prices to consumers who lose the benefits of competition among technologies, and deter innovation by manufacturers facing the risk of hold-up."[22]

24. The threat of patent hold-up is particularly acute from non-practicing entities (NPEs) or companies that do not materially participate in the product market applicable to the standard, because such entities operate on a different set of incentives than firms who will produce products based on the standards. An NPE "certainly has an incentive to induce the SSO

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19 Michel, Suzanne, Bargaining For Rand Royalties in the Shadow of Patent Remedies Law, *Antitrust Law Journal*, Vol. 77:889 (2011), p. 2 (75753DOC001688).

20 *See Microsoft*, No. 2:10-cv-01823, Dkt. No. 680, ¶ 62.

21 Michel, Suzanne, Bargaining For Rand Royalties in the Shadow of Patent Remedies Law, *Antitrust Law Journal*, Vol. 77:889 (2011), p. 1 (75753DOC001688).

22 The Evolving IP Marketplace: Aligning Patent Notice and Remedies With Competition, Federal Trade Commission, March 7, 2011, http://www.ftc.gov/os/2011/03/110307.pdf, p. 5 (75755DOC001861).

to adopt its own technology as the standard"[23] in order to receive licensing revenue once the standard is adopted. However, an NPE can also avoid the standard setting process; it does not need to worry about infringing the standard.[24] Also, royalties demanded by NPEs are very often particularly high because NPEs do not have mutual exposure and may not need to cross-license with other manufacturers.

25. "Although a patent confers a lawful monopoly over the claimed invention, its value is limited when alternative technologies exist."[25] "Firms may become locked in to a standard requiring the use of a competitor's patented technology. The patent holder's [intellectual property rights], if unconstrained, may permit it to demand supracompetitive royalties. It is in such circumstances that measures such as FRAND commitments become important safeguards against monopoly power."[26]

26. "The purpose of the FRAND requirements…is to confine the patentee's royalty demand to the value conferred by the patent itself as distinct from the additional value - the hold-up value - conferred by the patent's being standard-essential."[27] Standardization changes the dynamics of the process from one of competing technologies in which no single format could command more than a competitive price to one where market participants could find themselves locked into using a technology incorporated into a standard.[28]

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[23] Hovenkamp, Herbert J., Competition in Information Technologies: Standards-Essential Patents, Non-Practicing Entities and FRAND Bidding, University of Iowa Legal Studies Research Paper, No. 12-32, November 2012, p. 17 (75755DOC002216).

[24] *Id*.

[25] *Broadcom Corp. v. Qualcomm Inc.*, 501 F.3d 297, 313 (3d Cir. 2007) (75753DOC000898).

[26] *Id*.

[27] *Apple, Inc. v. Motorola, Inc.*, __ F. Supp. 2d __, 2012 WL 2376664, at *11 (N.D. Ill. June 22, 2012).

[28] Remarks of Chairman Deborah Platt Majoras, Federal Trade Commission, Recognizing the Procompetitive Potential of Royalty Discussions in Standard Setting, Stanford University,

27. Owners of a technology essential to a standard may be able to hold-up firms wanting to implement the standard by setting higher royalties and less favorable licensing terms relative to what would have been competitively possible before setting the standard.[29] "SSO members often agree to license SEPs on [F]RAND terms as a *quid pro quo* for the inclusion of their patents in a standard. Once a standard is adopted…an entire industry may become locked in to a standard, giving an SEP owner the ability to demand and obtain royalty payments based not on the true market value of its patents, but on the costs and delays of switching away from the standardized technology."[30]

28. In the fields of software development, telecommunications, and other areas, there also frequently exists what is called a "patent thicket."[31] This term refers to a situation in which a large number of patents are relevant to a single product or service, "requiring that those seeking to commercialize new technology obtain licenses from multiple patentees."[32] The dynamic of the patent thicket is often driven by the fact that companies must continually innovate in order to keep pace with competition. Thus, products include an array of technologies — patented and non-patented — which are required in order to be competitive.

29. The related issue of "royalty stacking" also arises from the fact that multiple patents (frequently hundreds or even thousands) often apply to a single product, especially in

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September 23, 2005, (Remarks prepared for Standardization and the Law: Developing the Golden Mean for Global Trade, Stanford University) (75687INT001893).

[29] Chapter 2: Competition Concerns When Patents are Incorporated into Collaboratively Set Standards, *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition*, U.S. Department of Justice & Federal Trade Commission, April 2007, p. 35-36 (75753DOC001140).

[30] Third Party United States' Federal Trade Commission's Statement on the Public Interest, International Trade Commission Inv. No. 337-TA-745, June 6, 2012, http://www.ftc.gov/os/2012/06/1206ftcwirelesscom.pdf, p. 2 (75755DOC002171).

[31] Shapiro, Carl, Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting, *Innovation Policy and the Economy*, Vol. 1 (2000), p. 119 (75753DOC001569).

[32] *Id*.

relation to standards-based technologies. *See Microsoft*, No. 2:10-cv-01823, Dkt. No. 680, ¶¶ 63-69. One consideration is the aggregated royalties resulting from royalty stacking, which can lead to commercially harmful and unsustainable royalty burdens.[33] Royalty stacking further aggravates the patent hold-up issue for collaboratively set standards since standard setting is likely to be "characterized by patent thickets, resulting in standard-compliant products being covered by hundreds, if not thousands, of patents."[34] "[R]oyalty stacking causes harm based on reduced output, higher prices, and thus deadweight loss."[35]

30. Even "low" royalty rates can be "sufficiently high that paying royalties for one patent can sometimes wipe out essentially all expected profit from the product," especially with components in the electronics industries.[36]

31. To address these issues of patent hold-up and royalty stacking, SSOs, such as the IEEE, typically request that participants (1) disclose the existence of any relevant intellectual property that could be essential to a standard before the standard is finally adopted and/or (2) commit to license any essential patents under RAND (or sometimes FRAND) terms.[37] *See*

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[33] Lemley, Mark A. and Carl Shapiro, Patent Holdup and Royalty Stacking, *Texas Law Review*. Vol. 85 (2007), p. 1993 (75755DOC002497).

[34] Maynard, Deanne E., Sean P. Gates, John Thorne, and Gail F. Levine, Written Comments of Verizon Communications Inc. for Federal Trade Commission Workshop on Standard-Setting Issues, Patent Standards Workshop, Project No. P11 1204, August 5, 2011, p. 3-4 (75753DOC000582); *see also* Lemley, Mark A. and Carl Shapiro, Patent Holdup and Royalty Stacking, *Texas Law Review*. Vol. 85 (2007), p. 2016 (75755DOC002497).

[35] Lemley, Mark A. and Carl Shapiro, Patent Holdup and Royalty Stacking, *Texas Law Review*. Vol. 85 (2007), p. 2015 (75755DOC002497).

[36] *Id*.

[37] Chapter 2: Competition Concerns When Patents are Incorporated into Collaboratively Set Standards, *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition*, U.S. Department of Justice & Federal Trade Commission, April 2007, p. 36 (75753DOC001140); Farrell, Joseph, John Hayes, Carl Shapiro, and Theresa Sullivan, Standard Setting, Patents and Hold-Up, *Antitrust Law Journal*, Vol. 74, No. 3 (2007), p. 635 (75753DOC005270); Lemley, Mark A., Intellectual Property Rights and Standard-Setting Organizations, *California Law Review*, Vol. 90, No. 6 (2002), p. 1904, 1906

Microsoft, No. 2:10-cv-01823, Dkt. No. 680, ¶¶ 51-52, 60-61, 70-74. "Inclusion of patented technology [into a standard] without a patent commitment … jeopardizes the goal of widespread adoption" of standards.[38]

32. RAND terms can thus "clear a path" for adoption of a technology platform by removing the threat of post-adoption "hold-up." Without RAND terms, many companies may make specific and significant investments into a standard, and then be "held up" from commercializing the technology or see substantial disincentives for further innovation by one party that claims to have patent rights relating to the standard—even a small portion of a standard.[39] The sunk costs of development of the standard and a product platform using the standard are greatly increased the longer the patent holder waits to declare their patents, allege infringement, or otherwise make demands contrary to binding RAND commitments.

33. The RAND commitment is an early agreement on the framework for later licensing and is designed to prevent patent hold-up after the standard is finalized.[40] RAND licensing commitments are important in encouraging companies to adopt a standard and invest in the development of standard-compliant products. RAND commitments also lead to low entry barriers and foster the wide adoption of a standard, thereby encouraging other companies involved in the standard setting process to contribute their own research and development to the

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(75753DOC000292); Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party, *Apple, Inc. v. Motorola Mobility, Inc.*, Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), *passim*.

[38] Comments of IEEE-SA, FTC Patent Standards Workshop, August 5, 2011, http://www.ftc.gov/comments/patentstandardsworkshop/00046-80184.pdf, p.2.; Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party, *Apple, Inc. v. Motorola Mobility, Inc.*, Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), p. 8; Letter from Thomas O. Barnett to Michael A. Lindsay, April 30, 2007, http://www.justice.gov/atr/public/busreview/222978.pdf, p.1 (75755DOC002349).

[39] Farrell, Joseph, John Hayes, Carl Shapiro, and Theresa Sullivan. Standard Setting, Patents and Hold-Up, *Antitrust Law Journal*, Vol. 74, No. 3 (2007), p. 603-604 (75753DOC005270).

[40] *Id*.

standard. Thus, many contributors and future users of the standard rely upon RAND commitments in making decisions about which technology among competing and viable alternatives should be incorporated into the standard.[41]

34. One of the fundamental principles underlying the consensus approach to standard setting is that the standards should be open without any one firm or small group of firms controlling the standard.[42] The benefit of having one's technology adopted in a formal standard is balanced by the commitment to license any patents alleged to be essential on RAND terms.[43] In other words, the RAND promise locks in adopters' access to the technology by granting them an "irrevocable right to use the patented technology to build to the standard, in exchange for a reasonable royalty and other reasonable terms."[44]

35. Many undertakings/assurances recognize that standard-body members and third-parties are relying on RAND promises—IEEE letters of assurance indicate that "users and implementers of the [Proposed] IEEE Standard…are relying or will rely upon and may seek

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41 Intel Corporation's Responses and Objections to Plaintiffs Ericsson Inc. and Telefonaktiebolaget LM Ericsson's Second Set of Common Interrogatories (Nos. 14-18) to Intel Corporation, p. 9.

42 Miller, Joseph S., Standard Setting, Patents and Access Lock-In: RAND Licensing and Theory of the Firm, *Indiana Law Review*, Vol. 40:351 (2007), p. 374 (75753DOC000606).

43 Miller, Joseph S., Standard Setting, Patents and Access Lock-In: RAND Licensing and Theory of the Firm, *Indiana Law Review*, Vol. 40:351 (2007), p. 374 (75753DOC000606); Third Party United States' Federal Trade Commission's Statement on the Public Interest, International Trade Commission Inv. No. 337-TA-745, June 6, 2012, http://www.ftc.gov/os/2012/06/1206ftcwirelesscom.pdf, p. 3 (75755DOC002171).

44 Miller, Joseph S., Standard Setting, Patents and Access Lock-In: RAND Licensing and Theory of the Firm, *Indiana Law Review*, Vol. 40:351 (2007), p. 389 (75753DOC000606).

enforcement of the terms of this LOA."[45] RAND rules and obligations serve as a "governance structure aimed at preventing opportunism."[46]

IV. THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS ("IEEE")

36. The Institute of Electrical and Electronics Engineers, Inc.[47] is "the world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity."[48] The IEEE was formed in 1963 by the merging of two older societies, the American Institute of Electrical Engineers (AIEE) and the Institute of Radio Engineers (IRE). The AIEE was founded in 1884 in order to aid professionals in the new field of electrical engineering. As it grew, the organization became focused upon electrical power with a secondary emphasis upon wired communication both through the telegraph and the telephone. The IRE was founded in 1912 to aid professionals in the field of radio and, later on, electronics. As technology grew, the roles of the two societies increasingly overlapped so that, eventually, the decision to merge was reached and the IEEE was born. Over its existence, the IEEE has expanded its interests beyond electrical engineering and computing to include "micro- and nanotechnology, ultrasonics, bioengineering, robotics, electronic materials, and many others." As of 2010, the IEEE had over 395,000 members in 160 countries.[49]

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[45] Letter of Assurance for Essential Patents, Telefonaktiebolaget L M Ericsson, April 18, 2011, http://standards.ieee.org/about/sasb/patcom/loa-802_11n-ericsson-18apr2011.pdf (75755DOC002565).

[46] Miller, Joseph S., Standard Setting, Patents and Access Lock-In: RAND Licensing and Theory of the Firm, *Indiana Law Review*, Vol. 40:351 (2007), p. 389,393 (75753DOC000606).

[47] History of IEEE, IEEE, (n.d.), http://www.ieee.org/about/ieee_history.html (75753DOC005494).

[48] About IEEE, IEEE, (n.d.), http://www.ieee.org/about/index.html.

[49] History of IEEE, IEEE, (n.d.), http://www.ieee.org/about/ieee_history.html (75753DOC005494).

37. The IEEE's central purpose is "to foster technological innovation and excellence for the benefit of humanity."[50] The IEEE takes as its goal "produc[ing] standards that any willing implementer can use and that will become widely adopted."[51] To that end, the IEEE participates in the creation of standards through the IEEE Standards Association (IEEE-SA), an SSO within the IEEE.[52] This organization's duties are to "establish, coordinate, develop, approve and revise IEEE standards" and to be the "IEEE interface in standards-related matters with external bodies."[53]

38. The development of IEEE standards follows a well-defined path and is guided by the five basic principles of (1) due process, (2) openness, (3) consensus, (4) balance, and (5) right of appeal.[54]

39. The IEEE has a multi-step process for standardization. The process begins with a call for interests from its membership. If there is sufficient interest in pursuing a proposed standard, a study group is formed to investigate and produce a project authorization request (PAR). The PAR is evaluated on five criteria to determine whether or not to move forward. The criteria are broad market potential, compatibility, distinct identity, technical feasibility, and

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50 IEEE Strategy, IEEE, (n.d.), http://www.ieee.org/about/corporate/strategy/index.html (75753DOC005570).

51 Comments of IEEE-SA, FTC Patent Standards Workshop, August 5, 2011, http://www..gov//comments/patentstandardsworkshop/00046-80184.pdf, p. 2 (75755DOC002387); Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party, *Apple, Inc. v. Motorola Mobility, Inc.*, Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), p. 8; Letter from Thomas O. Barnett to Michael A. Lindsay, April 30, 2007, http://www.justice.gov/atr/public/busreview/222978.pdf, p. 1 (75755DOC002349).

52 Yu, Shuang and Shruthi Bojamma, IEEE Standards Association Is Now an Associate Member of India Smart Grid Forum, IEEE-SA, May 17, 2012, http://standards.ieee.org/news/2012/isgf.html (75753DOC003508).

53 IEEE Constitution and Bylaws, IEEE, 2012, Section I-303, http://www.ieee.org/documents/ieee_constitution_and_bylaws.pdf (75753DOC005511).

54 Who Oversees the Process?, IEEE Standards Association, (n.d.), http://standards.ieee.org/develop/govern.html.

economic feasibility.[55] Once the project is approved by the IEEE, a working group is created to develop the standard. The working group is comprised of "individuals and/or entities…who volunteer to support the development of standards." After the election of officers, the group engages in various activities including discussion and debate to address important issues. A draft standard is compiled and may undergo many revisions before being finalized.[56] A draft must be approved by 75% of the working group in order to be forwarded to a sponsor ballot. Once a draft has been forwarded to a sponsor ballot and approved by 75%, it is submitted to the Review Committee and then to the IEEE Standards Board. If it is approved, it is published as an official IEEE standard.[57] Because standards are "living documents," they may be modified or updated after publication.[58] The IEEE may interpret, amend, renew, or withdraw the standard.[59]

40. The IEEE has promulgated policies and rules regarding the disclosure and licensing of patents.[60] The IEEE requires that a call for patents be issued at every working group meeting. The call asks participants to disclose if they believe any of their patent claims might be essential patents that would be necessary to the implementation of the standard, as well as any other parties' patents that might be essential to the standard. The IEEE, however, does not determine whether or not a disclosed patent's claims are actually essential.[61]

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55 Welcome to IEEE 802.11: Newcomer Orientation, IEEE 802 Plenary Session, October 6, 2011, p. 14.

56 How are Standards Made?, IEEE-SA, (n.d.), http://standards.ieee.org/develop/process.html.

57 How are Standards Made?, IEEE-SA, (n.d.), http://standards.ieee.org/develop/process.html; Welcome to IEEE 802.11: Newcomer Orientation, IEEE 802 Plenary Session, October 6, 2011, p. 11.

58 How are Standards Made?, IEEE-SA, (n.d.), http://standards.ieee.org/develop/process.html.

59 Welcome to IEEE 802.11: Newcomer Orientation, IEEE 802 Plenary Session, October 6, 2011, p. 17.

60 *See Microsoft*, No. 2:10-cv-01823, Dkt. No. 680, ¶¶ 38-43; Intel Corporation's Complaint in Intervention, p. 11.

61 Understanding Patent Issues During IEEE Standards Development, IEEE-SA, (n.d.), http://standards.ieee.org/faqs/patents.pdf, p. 1.

41. Currently, the IEEE-SA has a portfolio in excess of 900 active standards and approximately 500 new standards in development.[62] By facilitating the development of these standards, the IEEE enables companies to produce interoperable devices while still utilizing their own designs and unique features. This process provides consumers with the opportunity to choose from a large market of competitively-priced products.[63]

42. A large market is also important to product suppliers, especially those participating in Wi-Fi. Suppliers of computer chip components that enable wired and wireless communications in the end-consumer products incorporating those chip components tend to make very small profits on a per unit basis, so they must rely on large markets with high volume potential. If the cost of intellectual property is so high that it unreasonably hinders the suppliers of products that operate in accordance with the standard, the market for those products could be harmed, thus contradicting the goals of the IEEE. A Wi-Fi product, in particular, involves many different technologies, and could potentially incorporate technical aspects of hundreds or even thousands of patents. If all intellectual property owners offered unreasonable licensing terms, the cost of licensing could easily outweigh the gross profits made on a Wi-Fi product or even the price of the product itself. [64]

43. If a patent is declared as essential to a standard, the IEEE bylaws provide a written patent policy.[65] The IEEE-SA's September 2002 bylaws state that "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents [that the holder believes are]

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62 Yu, Shuang and Shruthi Bojamma, IEEE Standards Association Is Now an Associate Member of India Smart Grid Forum, IEEE-SA, May 17, 2012, http://standards.ieee.org/news/2012/isgf.html.

63 January 4, 2013, Expert Report of Dr. Matthew Shoemake.

64 *See* Wireless Connectivity Market Data, ABI Research, March 4, 2011, Table 3-3.

65 *See Microsoft*, No. 2:10-cv-01823, Dkt. No. 680, ¶¶ 38-43.

essential for compliance with both mandatory and optional portions of the standard. This assurance shall be provided without coercion and prior to approval of the standard..."[66] The IEEE depends on members and patent owners to disclose potentially essential patents; however, the IEEE does not determine or provide opinions regarding whether a patent is valid or essential.[67]

44. The IEEE bylaws as of 2002 required that an LOA ensure either that: (1) none of the patentee's patents disclosed to the IEEE as "essential" will be asserted against anyone using the patents to comply with the standard or (2) that a license will be provided "without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination."[68] These policies are largely similar to the IEEE-SA's 2011 bylaws.[69] The assurance is considered to be irrevocable and will, at a minimum, remain in place "from the date of the standard's approval to the date of the standard's withdrawal."[70]

45. The IEEE and all parties engaged in the process of standardization rely on other parties to adhere to this patent policy. Companies that produce products compliant with IEEE standards also depend on the compliance of others with the IEEE patent policy. If an individual or organization misrepresented its intentions with its intellectual property, the IEEE and its members would be deprived of valuable information that may have led to a different decision or

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66 IEEE-SA Standards Board Bylaws, IEEE-SA, September 2002, Section 6, p. 12 (75747DOC5811449).

67 IEEE-SA Standards Board Bylaws, IEEE-SA, 2011, Section 6.2, http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6; Understanding Patent Issues During IEEE Standards Development, IEEE-SA, 2011, p. 1.

68 IEEE-SA Standards Board Bylaws, IEEE-SA, September 2002, Section 6, p. 12 (75747DOC5811449).

69 IEEE-SA Standards Board Bylaws, IEEE-SA, 2011, Section 6.2.

70 IEEE-SA Standards Board Bylaws, IEEE-SA, 2011, Section 6.2.

outcome (such as adopting an alternative technology).[71] In such a situation, the IEEE would be deprived of its ability to make a fully informed decision upon which product suppliers will rely, causing them to face inaccurate investment incentives to invest in establishing new markets, and at the ultimate expense of customers.

V. THE IEEE 802.11 STANDARDS

46. There are a number of amendments to the 802.11 standard containing corrections and extensions, including a, b, g, and n.[72]

47. Prior to the adoption of the first 802.11 standard, wireless products manufactured by different vendors were rarely compatible with one another due to the use of non-interoperable technologies. In order to resolve this issue and to promote growth and innovation, the IEEE created the 802.11 specification.[73]

48. The IEEE also ratified the 802.11a specification concurrently with the 802.11b specification.[74] The 802.11a specification utilizes orthogonal frequency division multiplexing (OFDM) modulation rather than the direct sequence spread spectrum (DSSS) which is found in 802.11b. Also, 802.11a operates on a 5 GHz frequency, while 802.11b operates on a 2.4 GHz frequency.[75] The 802.11a amendment specifies a maximum data rate of 54 megabits per second (Mbps) compared to the specification of 11 Mbps in 802.11b.[76]

49. The 802.11g amendment, ratified in June 2003, utilizes the 2.4 GHz frequency (which is also true for the 802.11b amendment) and offers an increased maximum data

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71 January 4, 2013, Expert Report of Dr. Matthew Shoemake.

72 The Enterprise Applications Outlook in Business Insights, 2004, p. 110 (75753DOC002310).

73 Nogee, Allen, The Wireless Road Ahead—The Wireless LAN Chip Market Today and Beyond, In-Stat, March 2003, p. 5, 8 (75753DOC000920).

74 Negus, Kevin J. and Al Petrick, History of Wireless Local Area Networks (WLANs) in the Unlicensed Bands, *info*, Vol. 11 No. 5, 2009, p. 44, 47 (75753DOC000713).

75 Geier, Jim, 802.11 Alphabet Soup, Wi-Fi Planet, August 5, 2002 (75753DOC000033).

76 Geier, Jim, 802.11 Alphabet Soup, Wi-Fi Planet, August 5, 2002 (75753DOC000033).

throughput rate of 54 Mbps. It specifies an OFDM modulation scheme and is backwards-compatible with 802.11b.[77] The 802.11g Wi-Fi products began selling in larger quantities than 802.11b products in 2004.[78] With the release of 802.11g, several notable companies emerged as market leaders, including Atheros, Broadcom, Intel, and Marvell.[79]

50. The 802.11e and 802.11g amendments, along with other amendments, were incorporated in part into the 802.11-2007 standard.[80]

51. A subsequent 802.11n amendment was formally ratified in September 2009.[81] The 802.11n protocol specifies OFDM modulation, can operate in either the 2.4 or 5 GHz frequency bands, provides data rates of up to 600 Mbps, and is also backwards compatible with 802.11a, b, and g.[82] The 802.11n amendment incorporated numerous enhancements to increase throughput and range while also creating more robust connections.[83] It also permits multiple antennas or multiple input multiple output (MIMO) to enhance communication by leveraging multipath, "a phenomenon in wireless transmissions in which the signal reflects from walls and

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77 Smith, Tony, 802.11g is a Standard (Official), The Register, June 13, 2003, http://www.theregister.co.uk/2003/06/13/802_11g_is_a_standard/.

78 Wi-Fi IC Market Data, ABI Research, 3Q 2009, Table 3-2 (75753DOC003003).

79 Negus, Kevin J. and Al Petrick, History of Wireless Local Area Networks (WLANs) in the Unlicensed Bands, *info*, Vol. 11 No. 5, 2009, p. 52 (75753DOC000713).

80 Wi-Fi: Program Under Development, Overview, Via Licensing, (2012), http://www.vialicensing.com/licensecontent.aspx?id=1454.

81 IEEE Ratifies 802.11n, Wireless LAN Specification to Provide Significantly Improved Data Throughput and Range, Reuters, September 11, 2009, http://www.reuters.com/article/2009/09/11/idUS183099+11-Sep-2009+BW20090911; ERCDLINK0010923.

82 Glossary, Wi-Fi Alliance, (n.d.), http://www.wi-fi.org/knowledge_center_overview.php?type=3 (75753DOC002728); Negus, Kevin J. and Al Petrick, History of Wireless Local Area Networks (WLANs) in the Unlicensed Bands, *info*, Vol. 11 No. 5, 2009, p. 54-55 (75753DOC000713).

83 Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 4 (75753DOC002980).

objects, such as furniture."[84] While previous amendments operated on 20 MHz channels, the 802.11n amendment also defines the use of 40 MHz channels that are capable of encoding and transmitting more data than the 20 MHz channels.[85] Another enhancement is the Short Guard Interval (SGI) which also improves the data rate by shortening the gap between symbols.[86]

VI. WI-FI MARKET OVERVIEW

52. Wireless local area network technology has been in various stages of development for decades. In 1990, the IEEE began work on developing the 802.11 wireless standard. During September 1999, two Wi-Fi standards, 802.11a and 802.11b, were ratified, thus creating further stability in the market.[87] Since that time, the wireless market has experienced rapid growth. According to the Wi-Fi Alliance,[88] Wi-Fi chip component shipments reached 7.5 million units in 2001; in 2009, the one billionth Wi-Fi chip component was sold.[89] Today, one in every ten people around the world uses Wi-Fi at home or at work in countless ways.[90]

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84 Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 5 (75753DOC002980).

85 Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 6 (75753DOC002980).

86 Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 7 (75753DOC002980).

87 Negus, Kevin J. and Al Petrick, History of Wireless Local Area Networks (WLANs) in the Unlicensed Bands, *info*, Vol. 11 No. 5, 2009, p. 41, 44, 47 (75753DOC000713).

88 The Wi-Fi Alliance is a global non-profit industry association of hundreds of leading companies devoted to the proliferation of Wi-Fi technology across devices and market segments, http://www.wi-fi.org/organization.php.

89 Organization, Wi-Fi Alliance, (n.d.), http://www.wi-fi.org/organization.php (75753DOC002977).

90 Organization, Wi-Fi Alliance, (n.d.), http://www.wi-fi.org/organization.php (75753DOC002977).

53. There are many factors that contribute to the widespread acceptance of Wi-Fi, including the IEEE's brand, reputation, open processes, policies, and procedures, as well as industry support.[91]

A. The Wi-Fi Chip Component Market

54. A Wi-Fi chip component[92] typically consists of three main parts: (1) the radio (RF), (2) the MAC/baseband, and (3) the power amplifier (PA). The power amplifier enhances the radio signals and passes these analog signals on to the radio. The radio then converts these analog signals into digital signals for processing by the MAC/baseband. The MAC/baseband is the portion of the chip component (in some cases, a separate chip) that converts the digital signal into data packets, coordinates the physical radio interface components, transfers data to and from the host, transfers packets to temporary storage, and controls link level error correction (among other functions).[93] There is an established market for Wi-Fi chip components, which are separately sold to end-product manufacturers or their intermediaries so that those components can be incorporated into end products and provide Wi-Fi functionality to users of those products. Various market reports track the Wi-Fi chip component market.[94]

55. The Wi-Fi chip component market has evolved significantly since ratification of the first IEEE 802.11 standard in 1997.

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91 Jan. 4, 2013, Shoemake Expert Report ¶ 94.

92 The terms "Wi-Fi chip component," "Wi-Fi chip" and "Wi-Fi chipset" may be used interchangeably throughout these findings of fact and conclusions of law.

93 Tedesco, Gemma, Wi-Fi Chipset Fever: 140 Million and Growing, In-Stat, December 2005, p. 6-7 (75753DOC002254).

94 *See, for example*, Wi-Fi IC Market Data, ABI Research, 3Q 2009 (75753DOC003003) and Crystal, Celeste and Ken Furer, Worldwide WLAN Semiconductor 2004-2009 Forecast and Analysis, April 2005.

56. While the IEEE 802.11a and 802.11b standards were both ratified in September 1999.[95] To address this issue, Intersil, 3Com, Nokia, Aironet, Symbol, and Lucent formed the Wireless Ethernet Compatibility Alliance (WECA). They adopted the term "Wi-Fi" to certify compatible products. Apple and other computer-makers then began to offer Wi-Fi on their laptop products.[96]

57. Opportunities exist in the Wi-Fi chip component market for those suppliers that can provide innovative improvements to differentiate their products from competitors. Features such as low power consumption, reduced size, extended operating range, and cost reductions were some of the key innovations that were considered necessary to improve market share and sales volumes to levels necessary for profitability.[97]

58. Despite attempts, suppliers of Wi-Fi chip components were not able to largely differentiate themselves in the market by providing standardized 802.11 functionality alone.

59. Wi-Fi chip components were subject to rapid price declines amid significant competition.[98]

60. While the IEEE 802.11a and 802.11b standards were both adopted in September 1999, products based on the 802.11b standard were initially more popular, whereas those based on the 802.11a were not widely accepted in the market. The volume of Wi-Fi 802.11a IC

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95 Negus, Kevin J. and Al Petrick, History of Wireless Local Area Networks (WLANs) in the Unlicensed Bands, *info*, Vol. 11 No. 5, 2009, p. 44, 47 (75753DOC000713).

96 A Brief History of Wi-Fi, *The Economist*, June 10, 2004, http://www.marcus-spectrum.com/documents/economist.pdf (75775DOC000363).

97 Wi-Fi Integrated Circuit Market, ABI Research, 2004, p. 1-3.

98 Hachman, Mark, WiFi Becomes a Commodity, Extreme Tech, July 6, 2004, http://www.extremetech.com/extreme/56646-wifi-becomes-a-commodity (75753DOC003075); Untethered Fun: WLAN in Consumer Electronics Consumer Survey, In-Stat, July 2005, p. 16 (75753DOC002616).

(integrated circuit) shipments was small compared to the 802.11b standard.[99] Wi-Fi chip components based on the 802.11a standard were hindered by lack of interoperability with the installed base of 802.11b products.[100]

61. The 802.11 standard was later amended with the publication of 802.11g in 2003. Wi-Fi chip components based on the 802.11g standard experienced significant growth and success in terms of sales volumes, although price levels fell quickly after introduction.[101] Much of the popularity of 802.11g has been attributed to its backwards compatibility with 802.11b.[102] The large installed base of 802.11b Wi-Fi products, coupled with 802.11b price declines and the backwards compatibility of 802.11g helped to keep 802.11b products viable long after the new products became available.[103] There were numerous other factors and developments at the time 802.11g entered the market that contributed to its popularity, including improved battery life, smaller product size, more efficient power consumption, improved RF components, and advanced security features.

62. The first proprietary MIMO technology 802.11 "pre-n" products (signifying that the products were based on the draft 802.11n amendment) became available in 2005 from Airgo Networks and Atheros. In 2006, Atheros, Broadcom, and Intel were the first to offer 802.11 pre-n products.[104] In May 2007, the Wi-Fi Alliance created the "first 802.11 pre-n certifications compliant and interoperable to draft 2.0 based on products from industry leaders Atheros,

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99 *See also* Wi-Fi IC Market Data, ABI Research, August 6, 2010, Table 1-2 (75755DOC003295).

100 Wi-Fi Integrated Circuit Market, ABI Research, 2004, p. 1-5 (75753DOC003093).

101 Wi-Fi IC Market Data, ABI Research, 3Q 2009, Table 3-2, Table 3-5 (75753DOC003003).

102 Wi-Fi Integrated Circuit Market, ABI Research, 2004, p. 1-5; Lange, Peter, WiFi Update, PC Update, April 2004, http://www.melbpc.org.au/pcupdate/2404/2404article6.htm.

103 Wi-Fi Integrated Circuit Market, ABI Research, 2004, p. 1-4 – 1-5.

104 Negus, Kevin J., and Al Petrick, *History of Wireless Local Area Networks (WLANs) in the Unlicensed Bands*, *info*, Vol. 11, No. 5, 2009, p. 54 (75753DOC000713); 75724DOC0000043-75724DOC0000083.

Broadcom, Cisco, Intel, Marvell, and Ralink which eventually included products from Belkin, Linksys, and NETGEAR."[105] The 802.11n specification was formally ratified in September 2009[106] and the Wi-Fi Alliance subsequently updated their Wi-Fi CERTIFIED n program.[107] 802.11n grew from 8.7% of the Wi-Fi market in 2007 to 46.1% in 2009.

63. There are numerous downstream products that utilize Wi-Fi chip components based on the IEEE 802.11 standard, including notebook computers, consumer electronics, handsets, wireless adapters, and access points (APs) such as routers and gateways. According to Bernstein Research in 2010, these market segments together accounted for close to 94% of the total Wi-Fi certified products in that year.[108]

64. These product market segments that make use of Wi-Fi chip components have generally grown since 2001, and there are numerous evolving innovations and features contributing to their use in the marketplace.

65. When the 802.11g standard was introduced in 2003, the main competitors in the worldwide WLAN semiconductor market were Conexant, Broadcom, Atheros, and Intel.[109] In 2007, the year that draft-n certified products were released,[110] Intel was ranked third in

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105 Negus, Kevin J., and Al Petrick, *History of Wireless Local Area Networks (WLANs) in the Unlicensed Bands*, *info*, Vol. 11, No. 5, 2009, p. 54 (75753DOC000713).

106 IEEE Ratifies 802.11n, Wireless LAN Specification to Provide Significantly Improved Data Throughput and Range, Reuters, September 11, 2009, http://www.reuters.com/article/2009/09/11/idUS183099+11-Sep-2009+BW20090911.

107 Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 4 (75753DOC002980).

108 Rasgon, Stacy and Emily Chan, US Semiconductors - Wi-Fi: An Attractive Market Opportunity: What Applications Will Drive Growth, And Who Could Benefit?, Bernstein Research, March 28, 2011, p. 1, 6 (75755DOC000001).

109 Crystal, Celeste, Competitive Analysis: Worldwide WLAN Semiconductor 2004 Vendor Profiles, IDC, Vol. 2, May 2005, p. 1-2.

110 Intel Corporation's Responses and Objections to Plaintiffs Ericsson Inc. and Telefonaktiebolaget LM Ericsson's Second Set of Common Interrogatories (Nos. 14-18) to Intel Corporation, p. 7.

worldwide WLAN semiconductor revenue behind Broadcom and Atheros. As of the fourth quarter of 2010, the major Wi-Fi chip component suppliers included Intel, Broadcom, Atheros (now Qualcomm Atheros following an acquisition in 2011), Texas Instruments, MediaTek, Ralink, and Marvell.[111]

66. Notebook computer manufacturers typically have dual or multiple source contracts with suppliers of Wi-Fi chip components. For example, in 2004 and 2005, Dell utilized Broadcom, Intel, and Agere for 802.11b chip components and primarily Intel and Broadcom for 802.11g chip components.[112]

B. Competitive Product Pricing

67. The market for Wi-Fi chip components is highly competitive. Although Wi-Fi component competitors attempt to distinguish their products by incorporating the latest improvements, proprietary technologies/features, reducing power consumption, and combining functionality, Wi-Fi products become largely undifferentiated in features after market introduction.[113] Only first-to-market products with the latest technological enhancements can provide suppliers with opportunities for an initial (and temporary) advantage in pricing and

[111] Solis, Philip and Stuart Carlaw, Wi-Fi Chipset Evolution: From 802.11n to 802.11ac and 802.11ad: Single, Dual, and Tri-band and MIMO Configurations, ABI Research, August 31, 2011, p. 13-15 (75755DOC001420).

[112] Crystal, Celeste, Competitive Analysis, Worldwide WLAN Semiconductor 2005 Vendor Profiles, IDC, June 2006, p. 6 (75753DOC001106).

[113] Hachman, Mark, WiFi Becomes a Commodity, Extreme Tech, July 6, 2004, http://www.extremetech.com/extreme/56646-wifi-becomes-a-commodity (75753DOC003075); Untethered Fun: WLAN in Consumer Electronics Consumer Survey, In-Stat, July 2005, p. 16 (75753DOC002616). Commodities are products that are widely available and have little or no qualitative differentiation. Commoditization occurs when products lose differentiation across the marketplace such as with the dissemination of intellectual property necessary for its production. As products become commoditized, they lose their price premiums and are then priced as a function of the market as a whole.

profitability. Competitors producing chip components must be able to produce large volumes of products at low costs in order to achieve and sustain profitability.[114]

C. Wi-Fi Chip Component Licenses

68. Intel, a Defendant and supplier of Wi-Fi chip components to several of the Defendants, has entered into a number of license agreements involving 802.11-essential patents.

69. For example, in April 2007, ArrayComm LLC (ArrayComm) entered into an agreement with Intel (the 2007 Intel-ArrayComm License).[115] Under the terms of the agreement, ArrayComm granted Intel a non-exclusive, fully paid-up and lump-sum worldwide license to all U.S. and/or foreign patents and/or applications owned or controlled by ArrayComm at the effective date of the agreement.[116] The grant of patent rights also applied to Intel's subsidiaries and Intel customers.[117] In return, Intel agreed to pay ArrayComm a $5.5 million royalty.[118]

70. ArrayComm was estimated to have had at least 69 patents relevant to 802.11n as of the end of 2009.[119] If the value from the lump-sum payment could be attributed proportionally to these patents related to 802.11, that would lead to a per patent lump-sum payment of $79,710.[120] However, as this license agreement was for Arraycomm's entire patent portfolio, it is possible that they had additional patents besides those related to 802.11, a fact which would lead to an even lower per patent royalty.

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[114] Wi-Fi Integrated Circuit Market, ABI Research, 2004, p. 1-3.
[115] 75756DOC000680-91.
[116] 75756DOC000680-91 at 83-84.
[117] 75756DOC000680-91 at 83-84.
[118] 75756DOC000680-91 at 86.
[119] Technology Patent Report: 802.11 WLAN, Sunlight Research, 2009, p. 9.
[120] $5,500,000 / 69 = $79,710. If this per patent rate were applied to the six Patents-In-Suit, the lump-sum payment would be $478,260 ($79,710 * 6 = $478,260).

71. Intel and Kamilo Feher signed a Patent Purchase and Consulting Agreement in February 2000 with a designated completion date of January 15, 2001.[121] In the agreement, Feher sold, assigned, transferred, and conveyed to Intel all of his right, title, and interest in and to the patents.[122] In return, Intel granted to Feher an exclusive, perpetual, royalty-free, fully paid up and lump-sum worldwide license under the patents with sublicensing rights.[123] There are three patents in the agreement: U.S. patent numbers 5,491,457, 5,784,402, and 09/111,723, which has since become U.S. patent number 6,445,749.[124]

72. Intel agreed to pay an initial lump-sum payment of $300,000 to Feher within 30 days of the effective date and another lump-sum payment of $300,000 within 85 days after the effective date.[125] Regarding existing licensees, Intel agreed to two payments depending on whether Feher reforms the license agreements with all of the existing licensees: (1) $100,000 for each licensed party for which Feher completes all of the actions specified in the reformation of existing licenses section prior to the completion date, and (2) $300,000 if Feher completes all of the actions specified in the reformation of existing licenses section for all licensed parties prior to the completion date.[126]

73. These amounts provide a useful indicator of arms-length and commercially feasible fees at the chip-level for, among other things, Wi-Fi technology.[127]

VII. ERICSSON'S PORTFOLIO OF ALLEGED 802.11 ESSENTIAL PATENTS

74. Ericsson claims to be the owner of U.S. Patent Nos. 5,987,019 ("the '019 patent"), 6,466,568 ("the '568 patent"), 6,330,435 ("the '435 patent"), 6,424,625 ("the '625

[121] 75756DOC000829 at p. 1.
[122] 75756DOC000829 at p. 3
[123] 75756DOC000829 at p. 4
[124] 75756DOC000829 at p. 12; U.S. Patent 6, 445, 749.
[125] 75756DOC000829 at p. 3.
[126] 75756DOC000829 at p. 3.
[127] *See Microsoft Corp.*, No. 2:10-cv-01823, Dkt. No. 680, ¶¶ 583-87.

patent"), 6,772,215 ("the '215 patent"), and 6,519,223 ("the '223 patent") (collectively referred to herein as the "Patents-In-Suit").

75. On September 14, 2010, Ericsson filed a complaint against, inter alia, Acer, Gateway, D-Link, and NETGEAR for alleged infringement of the Patents-In-Suit

76. On June 8, 2011, Ericsson filed an Amended Complaint against, inter alia, Acer and Gateway, as well as Dell, Toshiba, and Belkin for infringement of the Patents-In-Suit.

77. On June 22, 2012, Intel intervened in this matter, and on July 3, 2012, Ericsson filed suit against Intel for alleged infringement of the Patents-In-Suit.

78. In addition to the Patents-In-Suit, Ericsson claims to hold additional patents, in the U.S. and abroad, that it claims are essential to the 802.11 standard. According to Ericsson, these patents include, for example, U.S. Patent Nos. 5,790,516; 6,621,796; 5,103,445; 5,797,094; 6,061,705; 6,252,908; 6,310,866; 6,418,130; 6,463,307; 6,813,260; 4,905,234; 6,778,501. In total, Ericsson claims to own 18 U.S. patents that it contends are essential to the 802.11 standard. Ericsson claims, however, that the "large majority" of the value of its portfolio of alleged 802.11-essential patents is represented by the six Patents-In-Suit.

VIII. ERICSSON'S 802.11 RAND COMMITMENTS

79. Ericsson has submitted two LOAs to the IEEE for its intellectual property that it claims is essential to 802.11. The first LOA was executed on January 29, 2003 and listed standards from 802.11a through 802.11i.[128] In this LOA, Ericsson committed to "grant a license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on

[128] Plaintiffs' Second Supplemental Responses to Defendants' First Set of Common Interrogatories (Nos. 1-9), p. 27.

reasonable terms and conditions to comply with the [Proposed] IEEE Standard."[129] Ericsson further clarified that it meant these terms to be FRAND, or "fair, reasonable, and non-discriminatory terms."[130] Ericsson executed a second LOA on April 18, 2011 that covered patents allegedly essential to 802.11n and further committed to license any patents essential to 802.11n on RAND terms.[131] In this letter, Ericsson "acknowledge[d] that users and implementers of the [Proposed] IEEE Standard … are relying or will rely upon and may seek enforcement of the terms of this LOA."[132] Ericsson's SSO and licensing policies appear to treat RAND and FRAND as indistinguishable.[133]

80. Ericsson has previously stated that a FRAND commitment is one where a "company agrees – subject to reciprocity – to reasonable, maximum aggregate royalty rates

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[129] Letter of Assurance for Essential Patents, Telefonaktiebolaget L M Ericsson, January 29, 2003, http://standards.ieee.org/about/sasb/patcom/loa-802_11-ericsson-29Jan2003.pdf, p. 2.

[130] Letter of Assurance for Essential Patents, Telefonaktiebolaget L M Ericsson, January 29, 2003, http://standards.ieee.org/about/sasb/patcom/loa-802_11-ericsson-29Jan2003.pdf, p. 4.

[131] 75755DOC002565; Letter of Assurance for Essential Patents, Telefonaktiebolaget L M Ericsson, April 18, 2011, http://standards.ieee.org/about/sasb/patcom/loa-802_11n-ericsson-18apr2011.pdf (75747DOC5809589).

[132] 75755DOC002565; Letter of Assurance for Essential Patents, Telefonaktiebolaget L M Ericsson, April 18, 2011, http://standards.ieee.org/about/sasb/patcom/loa-802_11n-ericsson-18apr2011.pdf; Deposition of Per Nordlöf December 13, 2012, 103-104. The fact that Ericsson's second LOA post-dated the approval of the 802.11n standard does not alter this analysis. For one thing, several of the technologies Ericsson accuses, including BlockAck and OFDM, were incorporated into the 802.11e standard, which was listed in Ericsson's first LOA. Under these circumstances, the 2003 LOA was binding with respect to future standards, including 802.11n. *See* also 75747DOC5811348 at 86 (an LOA is binding with respect to future standards whenever "(a) the application of the technology required by the amendment, corrigendum, edition, or revision of the same IEEE Standard has not changed from its previous usage and (b) the same Essential Patent Claims covered by the prior Accepted Letter of Assurance remain Essential Patent Claims in the same IEEE Standard or revision thereof."). In addition, the IEEE bylaws provide that LOAs are effective at least from the time of the approval of the standard, even if submitted afterwards. *See* IEEE-SA Standards Board Bylaws, IEEE-SA, September 2002, Section 6.2 (an LOA "shall apply, at a minimum, from the date of the standard's approval to the date of the standard's transfer to inactive status").

[133] Deposition of Gustav Brismark, September 7, 2012, p. 219-220.

based on the value added by the technology in the end product and to licensing negotiations, according to the licensors' proportional share of all standard essential IPR [intellectual property rights] for the relevant product category."[134] This statement reflects Ericsson's position that FRAND terms should follow (1) *aggregated reasonable terms*, which "should be *objectively commercially reasonable*, taking into account the *overall* licensing situation" and (2) *proportionality*, where "[c]ompensation under FRAND must reflect patent holder's proportion of all essential patents."[135] While this position was stated in relation to SEP licensing practices for cellular technologies where Ericsson's business has traditionally focused, Ericsson internally makes no distinction between FRAND (such as at the European Telecommunications Standards Institute) and RAND (used at the IEEE).[136] According to Ericsson, the FRAND royalty rate should also reflect the added value the patented technology brings to the licensed product.[137] Ericsson has also explained that not following FRAND licensing terms "disturbs the balance [in] the market when it comes to license fees for patents used in different technologies. This is not only unfair to other patent holders who have also agreed to work on FRAND terms, it also means that price on those products are higher than it should be, lowering demand for the product."[138]

81. According to Ericsson, for a FRAND rate to be reasonable, the individual rate offered by a company and the cumulative rate offered by all holders of SEPs must both be reasonable.[139] Internally, Ericsson has also acknowledged that a reasonable cumulative rate is one that allows market entry for new players, takes into account the essential patents for a

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[134] ERCDLINK0010955 at p. 4; *see also* ERCDLINK0010989 at p. 8, ERCDLINK0010999 at p. 3, ERCDLINK0011003, ERCDLINK0009013.
[135] ERCDLINK0011126 at slide 6, ERCDLINK0011140 at slide 1.
[136] Deposition of Gustav Brismark, September 7, 2012, p. 219-220.
[137] Deposition of Gustav Brismark, September 7, 2012, p. 208.
[138] ERCDLINK0010955 at p. 5.
[139] ERCDLINK0042852 at slide 7.

standard in relation to other patents in a product, and estimates the value of the technology to a specific product (for example, how the value of connectivity in a phone differs from connectivity in a car).[140]

82. Ericsson has further stated that the royalty rate to which a company is entitled depends on its contributions to the standard. Ericsson has noted that "it seems logical that a company which has contributed heavily should be rewarded to a higher degree than a company with only minor contributions in the standard."[141]

83. Ericsson's LOAs to the IEEE constitute binding contractual obligations to license patents it claims to be essential to the IEEE 802.11 standard.

84. Ericsson's commitments to the IEEE require it to license its patents on "Reasonable and Non-Discriminatory" ("RAND") terms to anyone using or implementing the standard and who desires a license.

85. As Ericsson acknowledges, RAND requires, among other things, that patents essential to practicing the standard must be licensed so that there are no blocking patents. Ericsson contends that Wi-Fi components (e.g. chipsets) supplied by manufacturers such as Intel infringe its allegedly-essential IEEE 802.11 patents. In spite of its LOAs, Ericsson refuses to license patents it claims are essential to the IEEE 802.11 standard to these manufacturers of Wi-Fi components (e.g., chipsets) like Intel on RAND terms.

86. Ericsson adheres to a policy of not licensing Wi-Fi component suppliers.[142]

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[140] ERCDLINK0042852 at slide 8.

[141] ERCDLINK0042959 at p. 3; ERCDLINK0163909 at p. 21.

[142] Deposition of Christina Petersson, p. 116:16-20; Deposition of Kasim Alfalahi, p. 181:22-182:3; Deposition of Gustav Brismark, September 7, 2012, p. 189:4-8; Deposition of Nihls Forslund, December 14, 2012, p. 49-50, 90; ERCDLINK0042909 at p. 6; ERCDLINK0166067 (slides 9-10)

87. Ericsson's stated reason for refusing to license manufacturers of Wi-Fi components is based on Ericsson's belief that such manufacturers cannot provide "reciprocity." Ericsson defines "reciprocity" as ensuring that Ericsson obtains RAND offers from companies throughout the whole value chain, rather than simply a cross-license to the licensee's own standards-essential patents. Ericsson's RAND obligations as reflected in its LOAs submitted to the IEEE, however, include no exclusions based on reciprocity.[143]

88. Ericsson's policy is to only license its alleged 802.11 essential patents to end-product manufacturers, who make more expensive multi-component computing devices. Ericsson's policy of not licensing manufacturers of Wi-Fi components is driven by a desire for higher royalty amounts (and thus increase its profits), and Ericsson's belief that it can tax the end-product manufacturer at a substantially higher rate than the suppliers of 802.11 Wi-Fi components that are incorporated into those end products.[144]

89. Ericsson's LOAs include no exclusion for particular types of companies, including no language that would exclude chipset suppliers from receiving RAND licenses to Ericsson's patents it believed essential to 802.11.

IX. ERICSSON'S VIOLATIONS OF ITS RAND COMMITMENTS

A. Ericsson's Royalty Demands Are Disproportionate To Its Contribution To the 802.11 Standard And Its Share of Alleged 802.11-Essential Patents

90. Ericsson internal "reference rates" for its allegedly essential IEEE 802.11n patents is 0.5% of the price of an end-user device, with a minimum royalty of $0.25 per device

[143] Deposition of Gustav Brismark, September 7, 2012, p. 185; Deposition of Gustav Brismark, December 12, 2012, p. 437

[144] ERCDLINK0036488-508 at 494-495; see also Deposition of Gustav Brismark, September 7, 2012, p. 189:9-12; Deposition of Nihls Forslund, December 14, 2012, p. 49,50,162-163; 90:11-16, 96:11-97:7; ERCDLINK0042909; ERCDLINK0166067 at 14 (noting that "Ericsson looses [sic] if licensing on the chiplevel"); ERCDLINK0164010 at 33.

and a maximum royalty of $0.50 per device, and Ericsson has demanded these rates from certain companies.

91. Ericsson seeks royalties of $0.25 to $0.88 per device from the Defendants with the exception of Intel, against whom Ericsson has not provided any royalty analysis or damages demand.[145] Ericsson's participation in the 802.11 standard-setting process has been minimal. Ericsson has acknowledged that it ended any R&D on 802.11 products and opted not to develop any 802.11 products in about 2001.[146] Ericsson has focused on cellular technologies, but placed very little if any focus on wireless LAN or 802.11 technologies.[147] Ericsson has admitted that its employees did not participate in the 802.11n task group at all, and that its employees did not submit any proposals to the IEEE task groups for 802.11a, g, or n.[148] Ericsson representatives have confirmed that Ericsson made no contributions to the 802.11a, b, g, or n standards,[149] that Ericsson had no involvement in the development of 802.11a or 802.11n, that Ericsson did not contribute to 802.11g, although a couple of its employees attended the working group at the time of its development, and that Ericsson made no contributions at all to the standard after 2003.[150] No Ericsson employee ever held any leadership positions in any 802.11 standards group,[151] and no third party or standards body has recognized it as a material contributor to 802.11.[152]

[145] Ericsson's rate range for makers of routers is between $0.34 to $0.59.
[146] ERCDLINK0007872 at p. 1; see also ERCDLINK0007760.
[147] Deposition of Jonas Sundborg - Ericsson's Director of Standardization (December 18, 2012), 19:1-20:12
[148] Ericsson's Responses to Defendants' First Set of Common Requests for Admission (Nos. 1-19), RFAs 12-15.
[149] Deposition of Andreas Iwerback (December 11, 2012), 101:21-23; 104:25-105:2; 104:8-10
[150] *Id.* at 102:10-15; 103:2-9; 104:5-7.
[151] *Id.* at 106:5-8. *See also* Deposition of Jonas Sundborg, 57:14-23
[152] *Id.* at 106:18-24.

Ericsson currently holds over 25,000 patents, but believes that only 18 of those are essential to the 802.11 standard, and that only nine or ten of these are essential to 802.11n specifically.[153]

92. Ericsson identifies only a single submission its employees made to IEEE 802.11—a May 2000 submission by Gunnar Rydnell to 802.11e.[154] Ericsson's proposal was decisively rejected as a solution that was not needed in Wi-Fi.

93. The IEEE's website lists IEEE Standards for which LOAs have been received from patent owners in accordance with the IEEE-SA Patent Policy.[155] Numerous patents may be used for the creation of the 802.11 standards. For example, Ericsson and 31 other companies have submitted LOAs claiming that they own patents covering essential technology to the 802.11n amendment.[156] Since 1993, there have been a total of approximately 274 LOAs submitted for all of the 802.11 standards.[157] However, of these, the majority were general declarations and did not specify the number of allegedly essential patents owned by the company.[158] For a number of reasons, there is no administrative or judicial statement of precisely how many standard-essential patents exist: Many LOAs do not identify the number of patents declared essential, not all companies have submitted LOAs, and most patents do not get litigated

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153 *Id.* at 109:19-23; 112:19-113:4; 114:2-11.

154 *See* Ericsson's Dec. 14, 2012, Second Supplemental Response to Interrogatory No. 9.

155 IEEE-SA Records of IEEE Standards-Related Patent Letters of Assurance for IEEE Standard 802.11 and Amendments, IEEE, (n.d.), http://standards.ieee.org/about/sasb/patcom/pat802_11.html.

156 January 4, 2013, Expert Report of Ray Perryman, Exhibit 1.

157 IEEE-SA Records of IEEE Standards-Related Patent Letters of Assurance for IEEE Standard 802.11 and Amendments, IEEE, (n.d.), http://standards.ieee.org/about/sasb/patcom/pat802_11.html. The LOAs were counted using the following method. If a company sent 1 LOA identifying 4 standards (e.g. 802.11a,b,g, and n), then it was counted as 4 LOAs. If a company sent 1 LOA identifying 1 standard, then it was counted as 1 LOA. In 802.11a and 802.11g, TDF and France Telecom submitted updates to their LOAs. Only the updated LOAs were counted.

158 IEEE-SA Records of IEEE Standards-Related Patent Letters of Assurance for IEEE Standard 802.11 and Amendments, IEEE, (n.d.), http://standards.ieee.org/about/sasb/patcom/pat802_11.html (75747DOC5809589).

and therefore have not been adjudged standard-essential.[159] In valuing alleged SEP portfolios, experts in the field have, however, attempted to estimate the quantity of patents that are or may be essential to the 802.11 standard.[160]

94. An estimate of 802.11 patents can be made by assuming that companies that submitted general LOAs hold as many claimed SEPs as the average company that did submit an LOA disclosing specific patents. This approach results in a conservative estimate of the total number of claimed essential patents for the 802.11 standards because many of the leaders in the wireless industry, such as Intel, Broadcom, Qualcomm, Atheros, Motorola, and Samsung filed blanket LOAs for their extensive 802.11 patent portfolios.

95. Chip component supplier Intel owns a significant portfolio of U.S. patents related to wireless technologies, including Wi-Fi, and has submitted numerous LOAs claiming essential patents related to the 802.11 standards. They include at least four LOAs relating to 10 standard amendments.[161] Other chip component suppliers such as Broadcom, Atheros, and Marvell have also submitted LOAs to the IEEE related to 802.11.[162]

96. There may well be several thousand claimed essential patents and patent applications that implicate a Wi-Fi chip component complying with the 802.11a, g, or n standards. Ericsson has submitted two LOAs for the 802.11n standards, which constitute at most

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[159] *See Microsoft Corp. v. Motorola, Inc., et al.*, No. 2:10-cv-01823, Dkt. No. 680, ¶¶ 63-69 (Apr. 25, 2013).

[160] See e.g., Feb. 12, 2013 January 4, 2013, Expert Report of Dr. Matthew Shoemake.

[161] IEEE-SA Records of IEEE Standards-Related Patent Letters of Assurance for IEEE Standard 802.11 and Amendments, IEEE-SA, (n.d.), http://standards.ieee.org/about/sasb/patcom/pat802_11.html; January 4, 2013, Expert Report of Ray Perryman, Exhibit 1.

[162] IEEE-SA Records of IEEE Standards-Related Patent Letters of Assurance for IEEE Standard 802.11 and Amendments, IEEE-SA, (n.d.), http://standards.ieee.org/about/sasb/patcom/pat802_11.html; January 4, 2013, Expert Report of Ray Perryman, Exhibit 1.

2.9% of the total LOAs submitted for the 802.11 standards. Furthermore, Ericsson represents only one of the 121 companies (less than 1%) that have submitted LOAs related to the 802.11 standards.

97. By count of LOAs, and estimates of essential patents, Ericsson's claimed 18 802.11-essential patents represent less than 2% of the total estimated number of 802.11 essential patents.

98. Evidence of the significant number of patented technologies relevant to the 802.11n standard can be found in several sources.[163] One example is a report by Sunlight Research, which identified 4,017 U.S. issued patents (in 11 separate technical categories) related to aspects of 802.11n as of the first quarter of 2011.[164] According to this third-party report, Samsung holds 261 patents, followed by Intel (235), Qualcomm (184), and Broadcom (183). According to the report, Ericsson holds 91 patents, which represents 2.3% of the total 4,017 potentially relevant patents.[165]

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[163] Sunlight Research LLC identified, evaluated, and ranked patents included in the 802.11n standard based on claim scope, design-around protection, and infringement detectability effort, *see* ERCDLINK0007820; ERCDLINK0007821; and Technology Patent Report: 802.11 WLAN (Full report), Sunlight Research, 2009. (75755DOC000589)

[164] Technology Patent Report: 802.11 WLAN, Sunlight Research, 2009, p. 7, 9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q1 2010, p. 6 (75755DOC001234); Technology Patent Report: 802.11 WLAN, Sunlight Research, Q2 2010, p. 6, 9 (75755DOC001290); Technology Patent Report: 802.11 WLAN, Sunlight Research, Q3 2010, p. 6, 9 (75755DOC001358); Technology Patent Report: 802.11 WLAN, Sunlight Research, Q4 2010, p. 6, 9 (75755DOC001359); Technology Patent Report: 802.11 WLAN, Sunlight Research, Q1 2011, p. 6, 9 (75755DOC001235).

[165] Technology Patent Report: 802.11 WLAN, Sunlight Research, 2009, p. 9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q1 2010, p. 9-10; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q2 2010, p. 9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q3 2010, p. 9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q4 2010, p. 6,9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q1 2011, p. 9.

99. Ericsson has submitted a single LOA for the 802.11n standard. Thus, given that 32 LOAs have been submitted related to the 802.11n standard, Ericsson's LOA represents 3.1% of the total LOAs submitted for the 802.11n standard.

100. Ericsson's alleged 802.11n essential patents represent, at best, 3.4% of the total estimated number of 802.11n essential patents, calculated by assuming that submitters of general LOAs had as many SEPs as the average submitter who did disclose specific patents.

101. Dr. Matthew Shoemake also performed an analysis on the question of royalty stacking and attempted to assess the potential volume of patents related to 802.11n. Based on 802.11n-specific keyword searches as well as an independent re-evaluation of a sample of patents identified by the Sunlight Research Report as relating to 802.11n, Dr. Shoemake was able to confirm that estimates placing the number of 802.11n-related patents in the thousands are reasonable, and Dr. Shoemake's analysis determined likely well over 3000 patents to the 802.11n standard.

102. Another source of quantification of the key IPR (patents and applications) related to the 802.11n standard and using global patent databases (e.g., USPTO, EPO, JIPO) is provided in a report by TechIPm, LLC.[166] This report lists the top 802.11n IPR holders as follows: Broadcom (244), Intel (227), Nokia (171), Samsung (134), Apple Computer (85), Marvell World Trade (72), InterDigital (71), RIM (69), Toshiba (64), Qualcomm (60), Sony (46), and Texas Instruments (TI) (44). The report does not include Ericsson although 8 additional companies are listed in a graphic of the report. A very conservative and favorable assumption for Ericsson is that it would have 43 patents (one less than TI) if included in this report and that the

[166] Global IEEE 802.11n WLAN Patent Portfolios Analysis, TechIPm, LLC, October 23, 2009, http://techipm-innovationfrontline.blogspot.com/2009/10/global-ieee-80211n-wlan-patent.html. (75775DOC000599)

other 8 companies not quantified would each have 22 802.11n patents; under these conditions, Ericsson's share of the total 802.11n patents would be about 2.9%.

103. Other companies, including those substantially involved in the development of the 802.11 standard at the IEEE, are estimated to have large portfolios of 802.11 patents. Intel was a major participant in the development of the 802.11n standard and was also heavily involved with the development of the other 802.11 standards. Intel has held a number of leadership positions in the 802.11 working group, including two current leadership positions in the 802.11 working group and at least sixteen leadership positions in IEEE 802.11 in the past.[167] Intel also made numerous technical contributions to the IEEE related to 802.11, including contributions related to Wi-Fi features accused by Ericsson. Some of these contributions are separately patented by Intel.

104. Other chip vendors, such as Broadcom, Qualcomm Atheros and Marvell, were also active in the development of the 802.11 standards and held a number of leadership positions. For example, Broadcom has been active in developing 802.11e and 802.11g.[168] Broadcom was also a major contributor in developing 802.11n.[169] Broadcom was a leader of the WWiSE group, which submitted one of the two main comprehensive technical proposals for 802.11n.[170] The WWiSE group later merged with another sub-group (TGnSync) led by Intel and others, to develop a joint proposal.[171] Broadcom, along with Intel and other semiconductor companies,

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[167] *See* IEEE 802.11 Current Working Group Officers, IEEE, (n.d.), http://www.ieee802./11/Photographs/officers.htm (75755DOC002288); IEEE 802.11 Leadership - Honor Roll, IEEE, (n.d.), http://www.ieee802.org/11/80211_honor_roll.htm; Expert Report of Matthew Shoemake, January 4, 2013.

[168] Deposition of Matthew Fischer, December 7, 2012 p. 17:9-12; 20:3-14; 31:5-11; 21:8-22; 24:25-25:3; 29:8-16 ; 30:6-18.

[169] Deposition of Matthew Fischer, December 7, 2012 p. 33:4-13; 34:20-25; 61:15-20.

[170] Deposition of Matthew Fischer, December 7, 2012 p. 42:19-43:13; 49:19-50:1; 36:18-37.

[171] Deposition of Matthew Fischer, December 7, 2012 p. 49:19-50:1.

developed and championed that joint proposal, which was eventually approved by the working group and incorporated into the standard.[172] Broadcom employees also chaired three of the ad hoc groups charged with addressing the over 15,000 technical and editorial edits to the proposal before final approval by IEEE in September 2009.[173]

105. Intel holds hundreds of patents related to the 802.11 standard. This is corroborated by at least one report from Sunlight Research that indicates that Intel holds 235 patents relevant to 802.11n, a number that continues to grow based on Intel's research and development of the 802.11 standards.[174] The TechIPm report similarly confirms that Intel is a major leader in 802.11n technology with 227 WLAN patents.[175] Intel was ranked second in the leader group for WLAN technology, while Ericsson is not mentioned in the report.[176]

106. Even based on its own calculations, Ericsson has estimated its share of alleged 802.11-essential patents at 3.9%, and applying its own internal methodology, it would be able to charge at most 3.9% of the reasonable maximum aggregated royalty rate.[177]

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[172] Deposition of Matthew Fischer, December 7, 2012 p. 50:7-12; 37:14-17; 40:10-17; 41:12-14; 42:3-5.

[173] Deposition of Matthew Fischer, December 7, 2012 p. 58:1-4; 59:24-60:2;59:19-21; 60:12-18; 61:1-8.

[174] Technology Patent Report: 802.11 WLAN, Sunlight Research, 2009, p. 7, 9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q1 2010, p. 6, 9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q2 2010, p. 6, 9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q3 2010, p. 6, 9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q4 2010, p. 6, 9; Technology Patent Report: 802.11 WLAN, Sunlight Research, Q1 2011, p. 6, 9.

[175] Global IEEE 802.11n WLAN Patent Portfolios Analysis, TechIPm, LLC, October 23, 2009, http://techipm-innovationfrontline.blogspot.com/2009/10/global-ieee-80211n-wlan-patent.html.

[176] Global IEEE 802.11n WLAN Patent Portfolios Analysis, TechIPm, LLC, October 23, 2009, http://techipm-innovationfrontline.blogspot.com/2009/10/global-ieee-80211n-wlan-patent.html.

[177] Deposition of Gustav Brismark, September 7, 2012, p. 212; Plaintiff's Responses to Defendant's Third Set of Common Interrogatories (Nos. 13-23), Interrogatory No. 20; Expert Report of Dietmar Harhoff, Ph.D., March 30, 2010, p. 20-21 (75755DOC001520).

B. Ericsson's Royalty Demands Are Disproportionate To The Relative Value Of The Accused Features

107. The features in 802.11n allegedly covered by the Patents-In-Suit represent, at most, marginal technological contributions to the 802.11 standards.

108. Products built to the various 802.11 specifications include much more than just the accused features, or even all essential patents that read on a standard. The accused features within Quality of Service ("QoS") and Block Acknowledgement represent a small fraction of the hundreds and likely thousands of features making up the 802.11 standard. Ericsson alleges that the Patents-In-Suit relate to only portions of 44 sections of the 802.11 standard.[178] There are 2,680 sections in the full 802.11-2012 standard. There are 517 sections in the 802.11n amendment.[179] The accused sections of the 802.11a/g/n standards — i.e., those for which Ericsson alleges the Patents-In-Suit are essential — represent only a small portion of the 2,680 sections in the 802.11 standards.

109. The 802.11n standard incorporated multiple enhancements to increase throughput and range while creating more robust connections.[180] For example, 802.11n incorporated the use of multiple antennas or multiple input multiple output (MIMO) to enhance communication by leveraging multipath, "a phenomenon in wireless transmissions in which the signal reflects from walls and objects, such as furniture."[181] While previous 802.11 standards operated on 20 MHz channels, the 802.11n standard doubled the available bandwidth to 40 MHz

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[178] Expert Report of Dr. Jerry Gibson, January 4, 2013.
[179] Expert Report of Dr. Jerry Gibson, January 4, 2013.
[180] Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 4-5; Jan. 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 70.
[181] Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 5; Jan. 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 70.

channels, allowing for further increased data rates.[182] In addition, the 802.11n standard incorporated a technique called Short Guard Interval (SGI), which also improved the data rate by shortening the gap between symbols.[183] Efficiency enhancements were added at the MAC layer of the 802.11n standard through frame aggregation and block acknowledgment.[184] Ericsson's accusations under the Patents-In-Suit against 802.11n products relate only to two technologies: Block Acknowledgement and QoS.

110. The highest throughput available for 802.11g is 54 Mbps.[185] 65 Mbps is the highest throughput available for 802.11n that has not implemented MIMO or Short Guard Intervals, or double channel width to 40 MHz.[186] There is thus an 11 Mbps increase from 802.11g to 802.11n. If the Short Guard Interval is implemented and the 40 MHz channel is used, the highest throughput is 150 Mbps — a 96 Mbps increase over 802.11g.[187] If the Short Guard Interval, 40 MHz channels, and MIMO are used, the maximum throughput is 600 Mbps — a 546 Mbps increase over 802.11g.[188] This data indicates that most of the throughput increase has to

[182] Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 6; Jan. 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 70.

[183] Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 7; Jan. 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 70.

[184] Wi-Fi CERTIFIED n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi Networks, Wi-Fi Alliance, September 2009, p. 7-8; Jan. 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 70.

[185] Wi-Fi CERTIFIED™ n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi® Networks, September 2009.

[186] Wi-Fi CERTIFIED™ n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi® Networks, September 2009.

[187] Wi-Fi CERTIFIED™ n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi® Networks, September 2009.

[188] Wi-Fi CERTIFIED™ n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi® Networks, September 2009.

do with other 802.11n features that are distinct from the minor aspects of the Block Ack and QoS features allegedly covered by Ericsson's patents.[189]

111. Wi-Fi chip components incorporate numerous patented, unpatented, and proprietary technologies that provide the functional features valued by consumers and are similarly not dependent on the Patents-In-Suit. Often, chip component suppliers such as Intel offer both basic Wi-Fi chip components as well as enhanced chip components with proprietary technology not included in the 802.11 standards.

112. The 802.11 chip components include or require many hundreds of non-802.11-related technologies, including: silicon wafers, transistors, connections, clocking, oscillators, filters, metal layers, packaging, pins, memories, microcode and software features and tools, and many manufacturing process technologies. The 802.11 standards likewise include a large variety of technologies which are unrelated to the Patents-In-Suit such as: multiple input and multiple output (MIMO), channel coding, channel bonding, aggregation, security, beamforming, association, authentication, signal modulation, medium access coordination, backwards compatibility, power management, data retransmission, data transmission feedback, and traffic management.[190]

113. IEEE 802.11 technology is implemented in Wi-Fi chip components that comprise electrical circuits on a die made out of materials such as silicon and copper. These circuits perform various tasks, calculations and operations. [191] A typical 802.11 chip may contain

[189] Wi-Fi CERTIFIED™ n: Longer-Range, Faster-Throughput, Multimedia-Grade Wi-Fi® Networks, September 2009.

[190] Expert Report of Matthew Shoemake, January 4, 2013; Expert Report of Jerry Gibson, January 4, 2013;

[191] Expert Report of Matthew Shoemake, January 4, 2013, ¶ 88.

various functions.[192] Each of these functions takes us a certain area or percentage of the die. Some of the functions of the Wi-Fi chip implement functions related to 802.11, and some do not.[193] A typical 802.11 chip have die area allocations as follows: 20% interface logic, 25% memory, 15% MAC layer, 20% digital PHY layer, 20% analog and RF circuity.[194] Of these areas only the MAC and digital PHY (or 35%) are specific to 802.11 technology.[195] Further, the portions of the MAC and digital PHY area that implement standards essential intellectual property are estimated to be 15-30%.[196]

114. Wi-Fi chip components include many proprietary features as well that are unrelated to Ericsson's claimed technology. For example, one of Intel's most basic models is the Centrino Wireless-N 105, which has 802.11 b/g/n compatibility with a single stream and a single band (2.4 GHz) for a bandwidth of up to 150 Mbps.[197] One of Intel's more advanced models is the Centrino Ultimate-N 6300, which has 802.11 a/g/n compatibility with three streams and two bands (2.4 GHz and 5 GHz) for a bandwidth of up to 450 Mbps. The Ultimate-N 6300 is also capable of utilizing Intel Wireless Display, which allows HDTVs up to 1080p to display media from a PC incorporating the chip component.[198] While both chip components are 802.11n-compatible, the value of the Wi-Fi chip components depends on the included features and specific functionality.

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[192] Expert Report of Matthew Shoemake, January 4, 2013, ¶ 88.
[193] Expert Report of Matthew Shoemake, January 4, 2013, ¶ 88.
[194] Expert Report of Matthew Shoemake, January 4, 2013, ¶ 88.
[195] Expert Report of Matthew Shoemake, January 4, 2013, ¶ 88.
[196] Expert Report of Matthew Shoemake, January 4, 2013, ¶ 88.
[197] Intel Centrino Wireless-N 105 Product Brief, Intel Corporation, 2012, http://www.intel.com/content/www/us/en/processors/centrino/centrino-wireless-n-105-brief.html (75775DOC000613).
[198] Intel Centrino Ultimate-N 6300 Product Brief, Intel Corporation, 2012, http://www.intel.com/content/www/us/en/processors/centrino/centrino-ultimate-n-6300-brief.html (75775DOC000609).

115. Intel's WiFi Link 5100 series product brief indicates that the series is "a family of IEEE 802.11a/b/g/Draft-N wireless network adapters that operate in both the 2.4 GHz and 5.0 GHz."[199] The features listed for the chip component include:

- Over 5X bandwidth increase with up to 300 Mbps Draft-N receive rates;
- Up to 2X greater range with support for two antennas to enable better wireless reception;
- Wireless personal area network solution through Intel My WiFi Technology for connectivity to consumer electronic devices;
- Optimized power modes for market-leading power consumption;
- Intel Active Management Technology for asset management, remote system diagnostics, network protection, and network security technology;
- Advanced wireless security through 802.11i supporting AES encryption;
- Easy-to-use Intel ProSet v 12.0 WLAN management software;
- Support for Cisco Compatible Extensions v4; and

116. Performance-optimized with Connect with Intel Centrino processor technology certified Access Points.[200]

117. The benefits of the features contained in the 5100 series chip components include shorter transfer times for large files; the enablement of applications such as High Definition (HD) video streaming, Voice over IP (VoIP), and multi-player gaming; a reduced number of "dead zones," network re-connects, and dropped data packets; and improved network diagnostics.[201]

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[199] Product Brief: Intel WiFi Link 5100 Series, Intel Corporation, 2008, http://www.intel.com/content/www/us/en/wireless-products/wifi-link-5100-brief.html (75615DOC000056).

[200] Product Brief: Intel WiFi Link 5100 Series, Intel Corporation, 2008, http://www.intel.com/content/www/us/en/wireless-products/wifi-link-5100-brief.html (75615DOC000056).

[201] Product Brief: Intel WiFi Link 5100 Series, Intel Corporation, 2008, http://www.intel.com/content/www/us/en/wireless-products/wifi-link-5100-brief.html (75615DOC000056).

118. Most of these features and advantages are unrelated to the Patents-In-Suit or the remainder of Ericsson's alleged 802.11 SEP portfolio, even accepting Ericsson's allegations as true. [202] These unrelated features found in the allegedly infringing chip components are evidence that there is other significant additional technology contained within each chip component that must be accounted for in an analysis of RAND terms. There are even multiple factors in addition to the offered technology that play into the decision of which Wi-Fi chip component supplier a downstream manufacturer uses and how a Wi-Fi chip component is priced. Furthermore, chip component suppliers invested in other elements, undertook significant business risks, and added significant features and improvements to their products in an effort to remain competitive in the marketplace for all 802.11 products.

C. Ericsson's Royalty Demands Are Based On End-Product Value Unrelated To Ericsson's Patents And The Accused Features

119. The accused Wi-Fi chipsets provide the allegedly infringing QoS and Block Acknowledgment features, and these Wi-Fi chipsets are merely included in end-products so they can provide Wi-Fi functionality.

120. The accused downstream products of the Defendants have numerous features that make them attractive to consumers, which are unrelated to the Patents-In-Suit.[203]

121. For example, one set of products accused of infringing the Patents-In-Suit are notebook computers. These products are accused of infringement because of their alleged compliance with the 802.11 standards; however, there are numerous features beyond Wi-Fi

[202] January 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 70.

[203] Ericsson selected the Patents-In-Suit because it viewed them as the strongest and most-closely applicable to the 802.11 standards. Ericsson has provided no grounds to conclude that other patents in its portfolio that it regards as essential to 802.11 have any special or unique value to the standards or to implementers of 802.11.

capability that make them attractive to consumers. For instance, one study indicates at least 251 technical interoperability standards in a modern laptop computer.[204]

122. One example of an accused product is the Dell XPS 15, which has numerous attractive features that customers value in addition to wireless capability. Dell advertises various features of the XPS 15 including the laptop's thin design, high definition display, and processing power. The XPS 15 features 3rd Gen Intel Core processors, Windows 8, and up to 8GB of memory.[205] The 15.6 inch screen features Full High Definition 1080p Truelife WLED Display, offering "superior image quality and razor-sharp resolution for the ultimate entertainment and productivity experience."[206] The laptop additionally is built with Waves MaxxAudio 4 sound enhancement technology and an optional Blu-ray disc drive for an enhanced audio and video experience. NVIDIA Optimus Technology in the XPS 15 automatically figures out how to optimize battery life while the user enjoys the benefit of performance-class graphics.[207] Wireless connectivity or capability is not specifically mentioned on the main advertisement webpage for the XPS 15.[208]

123. Another set of accused products in this case are routers, such as the Belkin N450 Wi-Fi Dual-Band N+ Router that features exclusive MultiBeam technology which offers powerful signal strength and allows connectivity from virtually anywhere in the user's home.

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[204] Biddle, Brad, Andrew White, and Sean Woods, How Many Standards in a Laptop? (And Other Empirical Questions), Arizona State University Sandra Day O'Connor College of Law Working Paper, September 10, 2010, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1619440 (75755DOC000126).*Cf. Microsoft Corp. v. Motorola, Inc., et al.*, No. 2:10-cv-01823, Dkt. No. 680, ¶ 63 (Apr. 25, 2013).

[205] New XPS 15, Dell, (n.d.), http://www.dell.com/us/p/xps-15-l521x/pd.

[206] Help me choose: Display, Dell, (n.d.), http://www.dell.com/us/p/d/help-me-choose/hmc-lcd-display-3d-consumer (75775DOC000526)..

[207] Optimus, NVIDIA Corporation, (2012), http://www.nvidia.com/object/optimus_technology.html.

[208] New XPS 15, Dell, (n.d.), http://www.dell.com/us/p/xps-15-l521x/pd.

Additionally, the router offers a simple setup and Parental Controls that allow users to block unwanted content to all devices.[209] Belkin N wireless routers also feature multiple 10/100 Ethernet ports on the back for optional wired connections, a vertical design to free up desk space, and external antennas for improved range.[210] The Belkin N+ wireless routers additionally include front-panel LEDs to display the Internet connection speed and a power-save mode.[211]

124. Belkin also offers numerous apps along with their routers for enhanced wireless networking. For example, the Memory Safe app automatically backs up digital files such as photos to an external hard drive attached to the router. Consumers can choose which files to back up and how often. The Self-Healing app "automatically detects and resolves network problems and runs routine maintenance scans to give the clearest wireless channel."[212] The Torrent Genie app allows users to download large media files while the computer is shut down or asleep to eliminate the need to babysit downloads. The Bit Boost app controls how the bandwidth of the network is used by allowing users to prioritize a specific activity to be supported first and then allocating the remaining bandwidth to other network applications.[213] Belkin also offers many apps for managing media files, such as the Music Mover or Video Mover apps that send music or videos from a hard drive connected to the router to any other Universal Plug-and-Play or DLNA-compatible device on the network, such as a Blu-ray player or PlayStation.[214] In addition, the Music Labeler app automatically matches music tracks to the correct title, artist, and genre based on a 40 million song database and the Daily DJ app creates personalized playlists from the

[209] N450 DB Wi-Fi Dual-Band N+ Router, Belkin, (n.d.), http://www.belkin.com/us/F9K1105-Belkin/p/P-F9K1105;jsessionid=32051BB630C03AD87941268B4BC06EDD.
[210] BELK00026693.
[211] BELK00026697.
[212] BELK00027375.
[213] BELK00027375.
[214] BELK00027375; Belkin Apps for Enhanced Wireless Networking, Belkin International, Inc. 2012, http://www.belkin.com/networking/apps/.

consumer's music library based on preset moods or the style of a particular song.[215] The Video Max app uses dual-bands to optimize "multiple media files like streaming video and games."

125. Ericsson similarly alleges that Toshiba's televisions infringe the Patents-In-Suit. While the accused televisions contain wireless connectivity (or can be enabled for wireless connectivity), the televisions themselves contain a bevy of other features which make them attractive to customers. For example, Ericsson accuses the Toshiba 55L6200U 55-inch 3D LED HD television of infringing the Patents-In-Suit. This product includes myriad features and technologies wholly apart and separate from the built-in wireless connectivity. For example, the television is "1080p Full HD," which delivers "the highest level of HD picture quality available today."[216] It can also present 3D content which allows customers to "[e]njoy games and movies in truly immersive 3D."[217] The television employs "DynaLight" technology which means the television "[a]utomatically adjusts the backlight intensity based on the image content."[218] It further utilizes "Dynamic Picture Mode" which provides "the right amount of 'pop,' and provides more colors, finer details, less visual noise and brighter, realistic pictures."[219] The television additionally includes advanced audio technologies (Audyssey Premium Television) and has HDMI ports (with HDMI-CEC support) for high definition connectivity and interoperability with other home entertainment components.[220]

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[215] BELK00027375.

[216] Toshiba 55L6200U 55" Class 1080P 3D LED HD TV, Toshiba Direct, (n.d.), http://www.toshibadirect.com/td/b2c/electronics-detail.to?poid=2000014388.

[217] Toshiba 55L6200U 55" Class 1080P 3D LED HD TV, Toshiba Direct, (n.d.), http://www.toshibadirect.com/td/b2c/electronics-detail.to?poid=2000014388.

[218] Toshiba 55L6200U 55" Class 1080P 3D LED HD TV, Toshiba Direct, (n.d.), http://www.toshibadirect.com/td/b2c/electronics-detail.to?poid=2000014388.

[219] Toshiba 55L6200U 55" Class 1080P 3D LED HD TV, Toshiba Direct, (n.d.), http://www.toshibadirect.com/td/b2c/electronics-detail.to?poid=2000014388.

[220] Toshiba 55L6200U 55" Class 1080P 3D LED HD TV, Toshiba Direct, (n.d.), http://www.toshibadirect.com/td/b2c/electronics-detail.to?poid=2000014388.

126. Ericsson has also accused various Acer products, including the Aspire series laptops. The Aspire Series offer a wide range of processor and memory alternatives for glitch-free multitasking and a choice of storage sizes.[221] They afford choices on screen sizes and are equipped with high resolution displays and graphics.[222] They offer different connectivity options, including Wi-Fi, 3G or wired Gigabit Ethernet.[223] And, with respect to design, they provide choices of slim profiles, aesthetic accents and multiple colors.[224] For example, Ericsson has accused the Aspire AS4830T of infringement. Although the Aspire AS4830T offers wireless connectivity, as with many other laptops on the market, it also contains many other features that consumers value.[225] For instance, the AS4830T features an Intel i3-2310M dual-core processor and an Intel HD Graphics 3000 graphics controller.[226] It contains a 500 gigabyte hard drive and a 14 inch widescreen CineCrystal display.[227] Among other things, it is further equipped with a webcam, an HDMI port, USB ports and Bluetooth, and offers eight hours of battery life.[228]

127. Ericsson has further accused NETGEAR routers, such as the NETGEAR WNDR3400 N600 Wireless Dual Band router, of infringement. The WNDR3400 contains many features, including the NETGEAR Genie which allows for simple setup and an easy dashboard

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221 AS4830T-6899 Features, Acer, (n.d.), http://us.acer.com/ac/en/US/content/model-features/NX.RGPAA.008.

222 AS4830T-6899 Features, Acer, (n.d.), http://us.acer.com/ac/en/US/content/model-features/NX.RGPAA.008.

223 AS4830T-6899 Features, Acer, (n.d.), http://us.acer.com/ac/en/US/content/model-features/NX.RGPAA.008.

224 AS4830T-6899 Features, Acer, (n.d.), http://us.acer.com/ac/en/US/content/model-features/NX.RGPAA.008.

225 AS4830T-6899 Datasheet, Acer, (n.d.), http://us.acer.com/ac/en/US/content/model-datasheet/NX.RGPAA.008.

226 AS4830T-6899 Datasheet, Acer, (n.d.), http://us.acer.com/ac/en/US/content/model-datasheet/NX.RGPAA.008.

227 AS4830T-6899 Datasheet, Acer, (n.d.), http://us.acer.com/ac/en/US/content/model-datasheet/NX.RGPAA.008.

228 AS4830T-6899 Datasheet, Acer, (n.d.), http://us.acer.com/ac/en/US/content/model-datasheet/NX.RGPAA.008.

to manage, monitor and repair home networks.[229] It also features ReadySHARE USB which provides for fast and easy access to an external USB storage device.[230] The WNDR3400 additionally offers live parental controls for blocking unsafe content and applications, and which can be managed from anywhere.[231] Further, it provides guest network access to provide separate security and access restrictions for guests using the network.[232] The WNDR3400 also includes a broadband usage meter that monitors Internet traffic and sends customized reports to help keep costs under control.[233] Moreover, it contains multiple 10/100 Ethernet ports.[234]

128. Ericsson has further accused D-Link routers, such as the D-Link Wireless N 300 DIR-615. The DIR-615 is equipped with multiple antennas to maximize the speed and range of wireless signals.[235] It also contains wireless network security through WPA or WPA2 encryption and utilizes dual active firewalls to prevent potential attacks from across the Internet.[236] The

[229] N600 Wireless Dual Band Router WNDR3400, NETGEAR, (n.d.), http://www.NETGEAR.com/home/products/wirelessrouters/high-performance/WNDR3400.aspx#one.

[230] N600 Wireless Dual Band Router WNDR3400, NETGEAR, (n.d.), http://www.NETGEAR.com/home/products/wirelessrouters/high-performance/WNDR3400.aspx#one.

[231] N600 Wireless Dual Band Router WNDR3400, NETGEAR, (n.d.), http://www.NETGEAR.com/home/products/wirelessrouters/high-performance/WNDR3400.aspx#one.

[232] N600 Wireless Dual Band Router WNDR3400, NETGEAR, (n.d.), http://www.NETGEAR.com/home/products/wirelessrouters/high-performance/WNDR3400.aspx#one.

[233] N600 Wireless Dual Band Router WNDR3400, NETGEAR, (n.d.), http://www.NETGEAR.com/home/products/wirelessrouters/high-performance/WNDR3400.aspx#one.

[234] N600 Wireless Dual Band Router WNDR3400, NETGEAR, (n.d.), http://www.NETGEAR.com/home/products/wirelessrouters/high-performance/WNDR3400.aspx#one.

[235] Wireless N300 Router DIR-615, D-Link, (n.d.), http://www.dlink.com/us/en/home-solutions/connect/routers/dir-615-wireless-n-300-router.

[236] Wireless N300 Router DIR-615, D-Link, (n.d.), http://www.dlink.com/us/en/home-solutions/connect/routers/dir-615-wireless-n-300-router.

DIR-615 features parental controls for supervising Internet activity.[237] It additionally includes multiple 10/100 Ethernet ports for wired transmissions.[238] The DIR-615 also features the D-Link Quick Router Setup Wizard to quickly configure and set the router up.[239]

129. The Defendants and Intel made significant investments in the technology and services related to their products which are not related to Ericsson's alleged patents. These investments helped to drive the Wi-Fi market and create an environment for the accused products to be successful. Ericsson's proposed royalty rate does not properly account for these contributions and overestimates the small impact, if any, of its alleged 802.11 patent portfolio relative to the 802.11 standards in general.

130. The licenses Ericsson relies on in an attempt to support its rate are not with suppliers of Wi-Fi chip components like Intel, Broadcom, and others whose Wi-Fi chipsets are accused of infringement, or that provide the allegedly infringing functionality.[240] Each of those licenses are with makers of end-products, and the rates are derived from end-product value and components that are unrelated to the 802.11 features Ericsson claims are covered by its patents.

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[237] Wireless N300 Router DIR-615, D-Link, (n.d.), http://www.dlink.com/us/en/home-solutions/connect/routers/dir-615-wireless-n-300-router.

[238] Wireless N300 Router DIR-615, D-Link, (n.d.), http://www.dlink.com/us/en/home-solutions/connect/routers/dir-615-wireless-n-300-router.

[239] Wireless N300 Router DIR-615, D-Link, (n.d.), http://www.dlink.com/us/en/home-solutions/connect/routers/dir-615-wireless-n-300-router.

[240] Ericsson ignores a 2002 license between it and Infineon covering the sale of WLAN chip components by Infineon. In this license, Ericsson granted Infineon a non-exclusive license to WLAN patents and know-how and agreed not to license certain hardware design databases to "any Ericsson external parties" for two years. The licensed patents included 55 patents applications, 18 of which are U.S. patents or applications. The licensed know-how transfer project cost to Infineon was $2.56 million. In addition, Infineon agreed to an annual royalty payment of $94,830 beginning in 2004. The agreement had an initial term of ten years, followed by one-year renewals until terminated by Infineon. The total royalty payments paid by Infineon for this initial ten-year term would be $948,300, not including the cost of the know-how transfer project since that is a cost only related to the licensed know-how. This amounts to a per U.S. patent effective lump-sum of $52,683.

131. The Option license agreements primarily related to patent portfolios related to various cellular standards.

132. Option primarily focused on products for the mobile communications industry and 802.11 functionality, when included in their products, was merely an additional feature.[241] Option's 2007 annual report states that "[t]he vast majority of Option's products continue to be sold though [*sic*] the distribution channels of various mobile operators…These companies include the Vodafone Group of Companies, T-Mobile Group, Orange Group, AT&T in the US, and eMobile in Japan."[242] Option was primarily interested in the cellular technology patents included in the license rather than the Wi-Fi patents.

133. The Option license agreement is not precise in determining the value of Ericsson's 802.11 portfolio. The Option license was also subject to lock-in. It therefore does not provide useful information for the hypothetical negotiation.

134. The Ascom license agreement differed from any hypothetical negotiation the parties would have had to determine a RAND royalty in this case because Ascom primarily markets VoWiFi handsets, pagers, alarms transmitters and access points for the healthcare industry as well as the hospitality, retail, and other industries.[243] Ascom is not a competitor to the Defendants in this case.

135. Furthermore, the final Ascom agreement was signed in 2012, which is five years after the time the hypothetical negotiation would have taken place in this case. The Ascom agreement was also subject to lock-in.

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[241] Option NV, Annual Report 2003, p. 13-17. (75775DOC000951)
[242] Option NV, Annual Report 2007, p. 33. (75775DOC001020)
[243] Expert Report of John Bone, January 4, 2013, p. 43.

136. The 2002 RIM license agreement was only for cellular patents. The subsequent 2007 and 2011 license agreements added 802.11 technology, but the focus of the agreements remained on Ericsson's alleged cellular patent portfolio. Under both the 2007 and 2011 agreements, Ericsson granted RIM worldwide rights to the GSM, GPRS, EDGE, WCDMA, UMTS and IEEE 802.11 standards, as well as to LTE and WiMAX in the 2011 agreement.[244] RIM's primary business is cellular phones, so it would have been much more interested in Ericsson's extensive telecommunications patent portfolio, to which 802.11 was merely an add-on from the 2002 agreement. The 2007 and 2011 RIM agreements were also subject to lock-in.

137. The Buffalo license agreement was not entered into until the end of 2009, almost three years after the date of the hypothetical negotiation. Furthermore, Buffalo is not similarly situated to the Defendants in this case, as Wi-Fi does not form a large part of its business, and U.S. sales comprised less than 3% of its worldwide sales. Buffalo's market share in the router and access point market in the U.S. is less than 5%. This is underscored by the fact that from October 2009 through June 2012, Buffalo paid only approximately $133,000 for its sales in the U.S. and $1.7 million for its sales outside of the U.S. This agreement was also subject to lock-in.

138. The Sonim license is not comparable because Sonim, unlike Defendants, does not sell Wi-Fi products; rather, it makes specialized cellular handsets. Sonim has not yet marketed or sold any products that comply with 802.11, and has therefore not paid royalties under the license for 802.11 functionality. The Sonim license agreement was also subject to lock-in.

[244] ERCDLINK0042131-185 at 133; ERCDLINK0042089-130 at 091.

139. The Hewlett-Packard ("HP") license agreement does not bear on a RAND royalty rate. The HP license agreement does not contain a royalty rate at all; instead, it calls for a $40 million lump sum payment from HP to Ericsson. The license is not to Ericsson's alleged Wi-Fi patent portfolio; it is a world-wide, fully-paid, non-transferable, and non-exclusive license to all of Ericsson's patents required to make the licensed products, including Ericsson's extensive cellular patent portfolio which makes up the vast majority of Ericsson's total patents. The HP license agreement was also subject to lock-in. Finally, the HP license agreement was signed in 2012, five years after the date of the hypothetical negotiation in this case. HP has never approved any royalty rate proposed by Ericsson.

D. The IEEE Rejected Prior Attempts To Impose High Royalties On 802.11 Like Ericsson's End-Product Based Royalty Demands

140. According to participants in the IEEE 802.11 standard setting process, RAND commitments and cost are part of the consideration when establishing a standard.[245] Performance and cost were both important criteria for comparison in the selection of technologies for the 802.11 standards. In 2001, a price of $5 to $10 was targeted for the Wi-Fi chip components and an aggregated royalty would have been a small percentage of the cost of the chip component of no more than five cents per unit. Because the price of chip components has fallen substantially since then, an aggregated royalty above a few pennies or fractions of pennies would be unreasonable.[246]

141. The IEEE considered a large royalty to be unacceptable.[247] Had the IEEE known that Ericsson would demand a high royalty fee from downstream companies, an

[245] January 4, 2013, Expert Report of Dr. Matthew Shoemake
[246] January 4, 2013, Expert Report of Dr. Matthew Shoemake.
[247] January 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 49.

alternative approach may well have been selected.[248] Examples from the time period such as the following support this conclusion:

- A modulation technique proposed by Dr. Kamilo Feher was rejected because his proposed $0.10 royalty per unit was deemed to be too high. A royalty free approach was adopted instead.
- The IEEE 802.11 group voted against acceptance of a proposal from Lucent/NTT regarding 802.11a in 1998 because they felt that the requested licensing fee (around 5% of selling price) was inordinately high and because it was unclear whether Lucent was assessing the royalty rate on the level of the end user product, which the IEEE participants would have considered unacceptable.
- When representatives from Lucent clarified that the 5% royalty would be 5% of the chip component (about $0.25), this royalty was still considered "a fairly large amount." The Lucent proposal was only accepted after its representatives clarified that 5% royalty was for a license on all its relevant technology and not limited to essential patents. This approach allowed others to design their own implementation and pay no royalties to Lucent.[249]

142. Officers of the IEEE, and persons with expertise in the IEEE's RAND rules and practices regard the obligation to license 802.11-essential patents subject to an LOA to apply to all users and implementers of the standard: this includes component suppliers, which are entitled to offers and a direct license on RAND terms for those products they make that operate in accordance with the standard. Such officers and experts also state that aggregated royalty rates for 802.11-essential patents should be in the range of pennies or less.[250]

E. Ericsson's Demands Fail To Account For Ex Ante Alternatives To The Accused 802.11 Features

143. Ericsson is seeking an *ex post* royalty rate, rather than a rate based on *ex ante* value. This *ex post* royalty is based on the value of the technology after it has been adopted as

[248] January 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 49.
[249] January 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 49
[250] January 4, 2013, Expert Report of Dr. Matthew Shoemake

part of a standard and firms have made significant investments based on the technology of the standard rather than the economic value of the technology compared to alternatives before standardization.

144. For example, the QoS technologies in the 802.11n standard that Ericsson accuses of infringing the ’019 and ’568 patents could have been omitted from the standard or simply not used. Additionally, the TID subfield (which Ericsson alleges infringes these patents) could have been dropped from the QoS control field. Furthermore, the accused QoS functionality is not used when an 802.11n device communicates with an 802.11a, 802.11b, or 802.11g device, and indeed is not even typically used by the accused products. In light of its limited usage, the value of these patents is minimal, at best.

145. There were alternatives available to the technologies in 802.11n that Ericsson accuses of infringing the ’215, ’223, ’435 and ’625 patents.[251] For example, alternatives to the technologies accused by Ericsson of infringing the ’215, ’435, ’625, and ’223 patents included at least MAC Service Data Unit (MSDU) aggregation, transmit frame bursting, or block acknowledgement without window shifting.[252] Furthermore, the technologies accused by Ericsson of infringing the ‘215, ’435, ’625, and ’223 patents could have been simply omitted or not used. [253] In addition, using a receive timer in the receiver was another alternative to the technologies accused of infringing the ’435, ’625 and ’223 patents.[254] Another alternative to the ‘215 patent consists of sending only compressed bitmaps. Moreover, using a retry attempt limit was available as an alternative to the functionality Ericsson accuses of infringing the ’223

[251] January 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 93.
[252] January 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 93; February 12, 2013, Expert Report of Chris Heegard Exh. V at 38-39.
[253] January 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 93.
[254] January 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 93.

patent.[255] The only chipsets Ericsson claims infringe the '223 patent are those sold by Intel and, in at least this respect, chipsets from other suppliers like Broadcom and Qualcomm Atheros are non-infringing alternatives.

F. Ericsson Has Sought Injunctions For Its Alleged 802.11-Essential Patents

146. In its complaint and counterclaims, Ericsson has requested injunctive relief against all of the Defendants including Intel, to whom it has never made a RAND offer. [256]

147. In August 2011 Ericsson filed a complaint against Acer (one of the customer defendants in this case) regarding alleged patent infringement in the Regional Court of Mannheim, Germany. In the Mannheim Case, Ericsson accused Acer products that were designed to function in accordance with the IEEE 802.11n standard and asserted three European counterparts to the patents-in-suit. Although Ericsson argued that the patents in the German case were essential to the standard, Ericsson nevertheless sought injunctive relief in order to pressure Acer to agree to favorable licensing terms.

X. ERICSSON'S DELAY IN BRINGING SUIT

148. The IEEE 802.11 standard has existed for over 20 years. The IEEE began working on the 802.11 standards at least as early as 1990. The IEEE approved the 802.11 standard in 1997 and since then the IEEE 802.11a, b, e, g, and n standards have followed. The IEEE 802.11a and IEEE 802.11b amendments were developed and ratified between 1997 and 1999; the IEEE 802.11g amendment was developed and ratified between 1999 and 2003; the IEEE 802.11e amendment was development and ratified between 2000 and 2005; and the IEEE 802.11n amendment was developed and ratified between 2003 and 2009.

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[255] January 4, 2013, Expert Report of Dr. Matthew Shoemake ¶ 93.

[256] July 8, 2011, Ericsson Amended Complaint ¶ 132; July 3, 2012, Ericsson Answer and Counterclaims to Intervenor Complaint, at 16-17.

149. Defendants such as Intel have contributed to the development of the IEEE 802.11 standard and its various amendments and hold many essential patents for the standard. Defendants have spent substantial resources related to IEEE 802.11-based products including research, development, improvement, and marketing of these products.

150. Intel released its first IEEE 802.11a and IEEE 802.11b compliant chip in 2002. It released its first IEEE 802.11g compliant chip in 2004 and its first IEEE 802.11n compliant chip in 2006. Intel has employed several hundred engineers and invested over $3.5 billion in the last decade on developing wireless networking technology, including Wi-Fi.

151. During this time, Intel has consistently invested in developing, improving, and marketing its wireless products, and continues to do so today. From 2000 through mid-2012, total actual capital expenditures related to the wireless products included capital expenditures of approximately $848 million, research and development (R&D) of approximately $1.76 billion, and marketing-related expenses of approximately $339 million. This amount thus represents an investment of approximately $2.95 billion in the development, improvement, and marketing of wireless products that include the products accused of infringement.[257]

152. Belkin has also made a significant investment in developing and marketing its wireless products, including those that Ericsson accuses of infringement.

153. NETGEAR has also spent a substantial amount of money in research and development and marketing on wireless products that include the products accused of infringement.

[257] *See* January 4, 2013, Expert Report of Ray Perryman, Exhibit 4.

154. D-Link has also spent a substantial amount of money in research and development and marketing on wireless products that include the products accused of infringement.

155. Acer has also spent a substantial amount of money in research and development and marketing on wireless products that include the products accused of infringement.

156. Toshiba has spent a substantial amount of money in research and development and marketing on consumer products that include the Wi-Fi chip components accused of infringement.

157. Dell has expended a substantial amount of money on the procurement and integration of Wi-Fi chip components into consumer products, including those that stand accused of infringement.

158. Ericsson knew about the IEEE 802.11 standards as they were being developed. Ericsson became aware of Defendants' marketing and sales of IEEE 802.11a, g or n products at or around the time that Defendants released products practicing those standards.

159. Ericsson claims that as of September 9, 2004, it was aware of its allegations against NETGEAR regarding the '435 and '625 patents. Ericsson further claims that as of September 21, 2004, it was aware of its allegations against NETGEAR regarding the '019 and '568 patents, and as of October 2, 2008, it was aware of its allegations against NETGEAR regarding the '215 patent.[258]

[258] Iwerback Exh. 19.

160. Ericsson claims that as of March 22, 2004, it was aware of its allegations against D-Link regarding the '435 and '625 patents, and was also aware that D-Link sold 802.11 compliant products on that date.[259]

161. Ericsson was aware that Acer sold 802.11 compliant products in 2007 or 2008.[260]

162. Nevertheless, Ericsson waited to file this lawsuit until Sep. 14, 2010 against Acer, Gateway, D-Link, and NETGEAR claiming that these Defendants' accused products contain 802.11 technologies that infringe Ericsson's Patents-In-Suit. Ericsson amended its complaint on June 8, 2011, to accuse Dell, Toshiba, and Belkin of infringing Ericsson's Patents-In-Suit. On July 3, 2012, Ericsson filed its Answer and Counterclaims to Intel's Complaint in Intervention, adding claims that Intel infringed the Patents-In-Suit. Ericsson delayed bringing this claim well after it knew that the IEEE and the industry adopted and approved the 802.11 standard.

CONCLUSIONS OF LAW

I. JURISDICTION AND VENUE

163. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 271 and 281-285. This Court has jurisdiction under 28 U.S.C. §§ 1331 and 1338(a), and venue lies in this district under 28 U.S.C. §§ 1391(b)-(c) and 1400(b).

164. In patent cases such as this one, the law of the Federal Circuit governs the substantive law to be applied. See 28 U.S.C. § 1295.

II. PROPER CALCULATION OF A RAND ROYALTY

A. Introduction

[259] Iwerback Exh. 19; Ercdlink0011293_0001-00003.
[260] Iwerback Tr. at 240:7-12.

165. In the calculation of a RAND royalty, the hypothetical negotiation should take place before any lock-in effects occur, and prior to any improper leverage that may be exerted *ex post facto* by a patent owner through hold-up. Moreover, both types of royalty analysis require considerations of aggregate royalties (sometimes know as royalty stacking) and both have the same damages period.

B. Date of the Hypothetical Negotiation

166. For standard-essential patents, the date selected should allow for the *ex ante* value of the patented invention and should be before lock-in and hold-up occur. Additionally, other factors to consider include the LOAs granted and participation by the then patent holders in development of the standards. All of these considerations lead to the conclusion that, with respect to SEPs, the time of the hypothetical negotiation is either prior to the incorporation of the specific accused functionality into the standard or prior to the adoption of the standard by the SSO.

167. Whether as part of a RAND or a reasonable royalty analysis, one objective of the hypothetical negotiation paradigm is to prevent patent damages from reflecting the value of any sunk investment or the "lock in" value of changing designs. Focusing the date of the hypothetical negotiation on a time prior to adoption of the standard helps prevent patent damages from improperly reflecting the value of hold-up, any sunk investment or other costs related to "hold-up" values of the patented technology once it is later incorporated into a standard. This timing in the context of RAND is also generally consistent with legal principles aimed at isolating an apportioned and true value of the patented invention (excluding value of the standard itself), *cf. Garretson v. Clark*, 111 U.S. 120, 121 (1884) ("The patentee . . . must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features."), and the fair distribution of the value

of the patented invention between a licensor and licensee that are both willing and reasonable in their negotiations, *see Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1337 (Fed. Cir. 2009).

C. Royalty Base

168. Determination of a RAND royalty is a two part process. First, one needs to determine the royalty base to use and then one needs to determine the appropriate royalty rate to use.

169. The Federal Circuit has provided substantial guidance concerning determination of the appropriate royalty base: "it is generally required that royalties be based not on the entire product, but instead on the 'smallest salable patent-practicing unit.'" *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012); *see also VirnetX Inc. v. Cisco Sys., Inc.*, No. 6:10-CV-417, 2013 WL 789288, at *4 (E.D. Tex. Mar. 1, 2013). The Federal Circuit has reasoned that this rule is grounded in the dangers inherent in end-user product based royalties: "[w]here small elements of multi-component products are accused of infringement, calculating a royalty on the entire product carries a considerable risk that the patentee will be improperly compensated for non-infringing components of that product." *LaserDynamics*, 694 F.3d at 67 (finding that plaintiff's use of laptop as royalty base did not satisfy the entire market value rule and that appropriate base was therefore the accused optical disc drive that embodied the accused technology).

170. The accused technologies in this case are embodied within 802.11 Wi-Fi chips.[261] Furthermore, Ericsson is asserting the Patents-In-Suit against only a small portion of the

[261] Plaintiff's Responses to Defendants' Third Set of Common Interrogatories (Nos. 13-23), Interrogatory No. 21; Deposition of Gustav Brismark p. 629, 630; Deposition of Andreas Iwerbäck p. 178-179; Plaintiff Microsoft Corporation's Post-Trial Brief, *Microsoft*

features embodied in the Wi-Fi chip components.[262] Therefore, the royalty would most appropriately be measured on a base no higher than the Wi-Fi chip component level (the smallest saleable unit that incorporates the patented technology).[263] Ericsson presents no analysis as to the amount of damages or RAND royalties if the royalty base is the Wi-Fi chip component.

D. Methods for Analyzing a RAND Royalty

171. A central approach to determining a RAND royalty involves proportionality — determination of the patent holder's appropriate proportional share of the royalties assessed against the standard, e.g., against the royalty base that reflects the value of the standard coupled with the interest of the licensor and licensee not unduly to burden the standard with excessive royalties in the aggregate. The value of that base must be shared among all standards-essential patent ("SEP") holders and thus, each SEP holder is only entitled to a proportionate share. In principle, proportionality recognizes that patent holders should not be disproportionately rewarded for the value of their patents compared to the whole picture, including actual or potential royalty burden arising from making, using or selling product that complies with a technical standard. For example, assume the total pool is made up of approximately 1000 patents related to a technical standard, and a patentee held a portfolio of 50 committed SEP patents, they would have roughly 5% of the pool. This proportional share (e.g., 5%) could now

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Corporation v. Motorola Inc., et al., p. 12; January 4, 2013, Expert Report of Dr. Matthew Shoemake.

[262] January 4, 2013, Expert Report of Dr. Matthew Shoemake.

[263] Hovenkamp, Herbert J., Competition in Information Technologies: Standards-Essential Patents, Non-Practicing Entities and FRAND Bidding, University of Iowa Legal Studies Research Paper, No. 12-32, November 2012, p. 11-12 (75755DOC002216); *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR , 2012 WL 5248439 at *8 (W.D. Wash. Oct. 22, 2012) (noting that since the patent owner's "standard essential patents only relate to the 802.11 and H.264 capabilities, which in turn only constitute a portion of [the] end products … [i]t would … seem illogical to turn around and base a RAND royalty on the end product price.").

be applied against the appropriate royalty base to derive the appropriate RAND amount for that patent holder on a per unit basis to license all 50 of that patent holder's SEP patents.

172. Proportionality derives from the recognition of the problems with patent thickets and royalty stacking — two core reasons why RAND assurances are required.[264] The analysis, in general, assumes that patents to the accused-standardized technology will tend to have an average value. Some patents may have a value higher than this average, and some patents will be below this average. But spread across the hundreds (or in many instances thousands) of patents that relate to a technical standard, this assumption is justified. This approach can then be used to assess a particular company's portfolio of patents to the standard, which one might assume will itself be made up of lower, average, and higher-value patents (confirming the basis of the assumption). Appropriate adjustments upward or downward could be made depending on additional evidence, if any, of the relative value of the patents comprising the portfolio. In any case, with an approximation of the size of the pool of potentially required

[264] Lemley, Mark A. and Carl Shapiro, Patent Holdup and Royalty Stacking, Tex. L. Rev. Vol. 85 (2007), at 1993; Rapp, Richard T. and Lauren J. Stiroh, Standard Setting and Market Power, Joint Hearings of the United States Department of Justice and the Federal Trade Commission, Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy, Washington, D.C., August 18, 2002, at 10; Swanson, Daniel G. and William J. Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust Law Journal*, Vol. 73, Issue 1 (2005), at 5; Hovenkamp, Herbert J., Competition in Information Technologies: Standards-Essential Patents, Non-Practicing Entities and FRAND Bidding, University of Iowa Legal Studies Research Paper, No. 12-32, November 2012, at 11-12; Swanson, Daniel G. and William J. Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust Law Journal*, Vol. 73, Issue 1 (2005), at 8, 10-11; Farrell, Joseph, Hayes, John, Shapiro, Carl, and Sullivan, Theresa, Standards Setting, Patents, and Hold-up, *Antitrust Law Journal*, Vol. 74, No. 3 (2007), at 636; Miller, Joseph S, Standard Setting, Patents and Access Lock-In: RAND Licensing and the Theory of the Firm, Ind. L. Rev. Vol. 40 (2006), at 357; *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR, 2012 WL 2030098, *5–6 (W.D. Wash. June 6, 2012).

patents, and the size of a company's portfolio, one can estimate the company's relative share of the pool.

173. Other methods of analyzing and assessing the appropriate value of the patented invention as part of a RAND determination are available. For example in valuing patents allegedly essential to a standard, it is important to consider the *ex ante* value, if any, that is attributable to the individual patents within a standard rather than any value conferred by the totality of the standard, or through standardization itself. One means often employed by experts in the relevant technology and in economics for measuring the incremental value of the patented technology is to compare against alternatives.[265] In the context of a hypothetical negotiation, the availability of substitutes and the incremental value, if any, of the patented invention over those substitutes should act as a cap.[266] This should be true within or outside the context of patents alleged to be essential to a standard, although in the context of the standard, one examines alternatives available while the standard was being developed — "[c]ourts should recognize that when it can be determined, the incremental value of the patented invention over the next-best alternative establishes the maximum amount that a willing licensee would pay in a hypothetical negotiation. Royalties should not be set higher than this amount."[267] This approach may be used

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[265] *See, e.g.*, *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1159 (6th Cir. 1978); *Hughes Tool Co. v. G.W. Murphy Indus., Inc.*, 491 F.2d 923, 931 (5th Cir. 1973); *Smithkline Diagnostics, Inc. v. Helena Labs. Corp.*, 12 U.S.P.Q.2d 1375, 1379 (E.D. Tex. 1989), *aff'd*, 926 F.2d 1161 (Fed. Cir. 1991).

[266] *See Riles v. Shell Exploration & Prod. Co.*, 298 F.3d 1302, 1312 (Fed. Cir. 2002) ("The economic relationship between the patented method and non-infringing alternative methods, of necessity, would limit the hypothetical negotiation.").

[267] The Evolving IP Marketplace: Aligning Patent Notice and Remedies With Competition, Federal Trade Commission, March 7, 2011, http://www.ftc.gov/os/2011/03/110307.pdf, at 189; *see also, e.g.*, *Zygo Corp. v. Wyko Corp.*, 79 F.3d 1563, 1571-72 (Fed. Cir. 1996) (vacating and remanding the district court's damages determination where both lost profits and reasonable royalty failed to take into account non-infringing alternatives that would have given the alleged infringer a "stronger position to negotiate for a lower royalty rate); *Apple,*

as an independent assessment in valuing patents and assessing royalties, and may further be combined with analyses concerning apportionment of the smallest salable unit as a royalty base. Employing multiple approaches can help act as a further check on the determined royalty, and can aid with the correctness of other assumptions (such as the relative/average value of a patent or portfolio).

E. Determining a RAND Royalty

174. Determination of a RAND royalty begins with the market price of various chip components (industry average and vendor specific). Since there is a well-established market price for Wi-Fi chip components, this price apportions for the actual functionality of 802.11 more accurately than other measures. The prices of chip components, as is often the case with technology components and devices, have trended decidedly downward over time and are projected to decrease to $1.40 by 2016 for a dual-band 802.11n chip component.[268] However, as a conservative starting point, $2.41, the 2010 average 802.11 price may be used as an upper-bound chip price, although many chips are less expensive than this. A more recent, and lower chip price of $1.18 for basic 802.11n functionality may also be used in order to provide a less conservative estimate.

175. Apportionment of the price of the alleged patent-practicing unit (the Wi-Fi chip component) is also important to better isolate the 802.11 standard-essential functionality. As noted, the value of a Wi-Fi chip component is based on numerous contributions beyond those related to the 802.11 or 802.11n standards; examples include, among other, power consumption, amplification, thermal and vibration control, interference, software code, cost of goods, and

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Inc. v. Motorola, Inc., No. 1:11-cv-08540, 2012 WL 1959560, at *7 (N.D. Ill. May 22, 2012) (explaining that the lowest cost of avoiding patent infringement, either by "invent-around software development or in loss of consumer goodwill (resulting in a loss of sales revenue)," would be the "ceiling on [a potential infringer's] willingness to pay for a patent license.")

[268] *See* Table: Wi-Fi Chipset ASPs by Primary Protocols, World Market, Forecast: 2010 to 2016.

manufacturing. A conservative assumption is that on apportionment of the technology, about 35% of the chip component's value is attributable to 802.11 technology value contributions.[269] This amount excludes technologies such as host interfaces, memory, and analog/RF radio technologies, that are unrelated or tangential to the core 802.11 technologies.

176. Before applying this estimate of 35%, it is appropriate to include a downward adjustment to reflect the fact that the entire allocation to 802.11 cannot be paid to holders of SEPs. For example, there are costs associated with manufacturing and distribution, as well as the need for suppliers to earn a reasonable profit and cover general and administrative expenses. Intel actually has an operating loss on its Wi-Fi business when Wi-Fi related expenses for R&D, marketing, and general and administrative expenses are included. Nevertheless, a conservative estimate may omit such a downward adjustment, assuming that all of the 35% of the value of the chip component attributable to 802.11 technology is due to SEPs, which results in an upper-bound value of $0.84 ($2.41 x 35%) per Wi-Fi chip component and a lower-bound value of $0.41 ($1.18 x 35%).

177. As a more appropriate assumption, it is also possible to calculate the RAND rate after apportioning the 35% attributable to 802.11 further by assuming that 50% of the 802.11 technology is attributable to SEPs, which results in an upper-bound value of $0.42 ($2.41 x 35% x 50%) and a lower-bound value of $0.21 ($1.18 x 35% x 50%) per Wi-Fi chip component.

178. Likewise for 802.11n, it is possible to assume that half of the 802.11 technology is attributable to 802.11n, namely 17.5% of the chip component's value. This assumption is conservative considering that only 24% of the estimated number of SEPs for all the 802.11 standards pertain to 802.11n. Assuming all of the technology in the apportioned 802.11n amount

[269] January 4, 2013, Expert Report of Dr. Matthew Shoemake.

is attributable specifically to 802.11n SEPs results in an upper-bound value of $0.42 ($2.41 x 17.5%) per Wi-Fi chip component and a lower-bound value of $0.21 ($1.18 x 17.5%). Again, with the more realistic, albeit conservative, assumption that 50% of 802.11n technology is embodied in the SEPs, there is an upper-bound value of $0.21 ($2.41 x 17.5% x 50%) per Wi-Fi chip component and a lower-bound value of $0.10 ($1.18 x 17.5% x 50%).

179. Ericsson's share of LOAs and its own estimate of its 802.11-essential patents, as well as Ericsson's estimate of its percentage of 802.11 standard essential patents compared to all patent holders with 802.11 SEPs, yield a range of 1.8 to 3.1% for Ericsson's share of 802.11 standards-essential patents. A conservative approximation of Ericsson's proportion of the 802.11 essential patents is about 2.0%.

180. Based on Ericsson's concluded share of the total 802.11 IPR, and applying this illustrative methodology, Ericsson's 802.11 SEP portfolio would have an indicated RAND value range of $0.004-$0.017 per unit.[270] Ericsson's demands are orders of magnitude above these amounts and are, hence, not RAND.

181. Even assuming an extreme example where there is no apportionment of the Wi-Fi 802.11 chip component price, and using Ericsson's overly favorable prior assertion that it had about 3.10% of the share of 802.11 SEPs, the rate as applied against a basic Broadcom 802.11 Wi-Fi chip component would be about $0.037 ($1.18 x 3.1%) per unit.

182. A similar methodology may be used to derive examples of rates for Ericsson's alleged 802.11n SEPs, utilizing the same information as well as Ericsson's share of LOAs, Ericsson's own estimate of its 802.11n standard essential patents, and Ericsson's share of 802.11n relevant patents in the Sunlight Research reports. These yield estimates ranging from

[270] $0.004 = $1.18 * 35% * 50% * 2%. $0.017 = $2.41 * 35% * 2.00%.

2.3% to 3.4% for Ericsson's share of 802.11n-essential patents, and a conservative approximation of 3.0%. Based on Ericsson's concluded share of the total 802.11n IPR, this analysis produces a potential value for Ericsson's alleged 802.11n SEPs of $0.003-$0.013 per unit. Because the 6 Patents-In-Suit represent about 75% (6 out of 8) of Ericsson's alleged 802.11n SEPs, the Patents-In-Suit would have a value of $0.002-$0.009 per unit. Even again assuming no apportionment of the 802.11n component pricing for either the 802.11 or 802.11n technology (which would improperly and significantly inflate any determination of rate in favor of Ericsson), one could multiply the $1.18 chip component price by Ericsson's share of 802.11n patents derived from third-party reports of 2.27% to produce a rate of $0.027.

183. Although a hypothetically negotiated license to the Patents-In-Suit may result in a running royalty rate as described above, the more likely outcome would be a fully paid-up, lump-sum payment to Ericsson for a license through the life of the patents or a shorter, fixed term of years with the prospect of renewal as is common in the licensing industry.

184. Lump-sum royalties can be determined based on an analysis of licensing agreements that are comparable to the hypothetically negotiated agreement for a license to the Patents-In-Suit. The Ericsson-Infineon license resulted in total royalty payments for the initial ten-year term of $948,300, which is a per U.S. patent effective lump-sum of $52,683.[271]

185. The Intel-ArrayComm agreement is a comparable license agreement produced by Intel in this matter. This license indicates that a similar license for the much smaller group of Wi-Fi related patents at issue in this matter would be about $480,000. Additionally, Intel

[271] ERCDLINK0024087-96 at 90. The Euro-USD exchange rate on the date the agreement was executed (June 12, 2002) was 0.9483; *See* Historical Exchange Rates, EUR/USD, OANDA, (n.d.), http://www.oanda.com/currency/historical-rates/. €100,000 * 0.9483 = $94,830; $94,830 * 10 = $948,300; $948,300 / 18 = $52,683.33.

acquired several patents, some of which may have been related to wireless technology, for a $600,000 payment.[272]

186. Another common method of determining a lump-sum royalty, which Ericsson has used in prior licensing situations, is to determine the present value of the future royalty payments that would be paid to the licensor based on a licensing rate and expected volume of licensed products. In this case, the historical volumes of accused products are determined and future accused units to be licensed through the economic life of the products or patented technology (not to exceed the date of patent expiration) are projected. This type of analysis is commonly utilized by corporations to evaluate a variety of investments and projects, including licensing agreements.

187. A lump sum may be derived based on an estimation of the likely yearly volumes of units that would be subject to the hypothetical license beginning on the alleged date of first notice. Future sales estimated based on forecasts of 802.11n chipset volumes, for instance by ABI Research. Future payments would also be discounted, using a risk-free rate for U.S. Treasury bonds as of January 2007, reflective of the time value of money.

188. The appropriate lump sum royalty depends on the timeframe over which the license agreement is in force. Two plausible lump sums are: (1) notice date through the end of 2014 (a five year term), and (2) notice date through expiration of the patents-in-suit in March 2020. The lump sums associated with the 0.9 cent and extreme, upper bound 3.7 cent royalty rates are as follows:

[272] Samsung Electronics Co. ('75676DOC203258-3262, 75676DOC203277-3286) and Symbol Technologies, Inc. (75676DOC000539-634); 75756DOC000829 at p. 3.

Lump Sums for Patents-in-Suit (0.9 cents)
(Notice Date through 2014 or 2020)

	0.9 cents	
	2014	2020
Intel	$61,590	$135,220
Dell	$101,326	$234,688
Belkin	$47,896	$145,477
Toshiba	$166,884	$381,798
D-Link	$32,607	$85,861
NETGEAR	$151,173	$369,073
Acer/Gateway	$109,206	$275,806
Intel - U.S.	$672,345	$1,596,297

Lump Sums for Patents-in-Suit (3.7 cents)
(Notice Date through 2014 or 2020)

	3.7 cents	
	2014	2020
Intel	$253,204	$555,903
Dell	$416,561	$964,828
Belkin	$196,904	$598,072
Toshiba	$686,079	$1,569,615
D-Link	$134,050	$352,985
NETGEAR	$621,491	$1,517,301
Acer/Gateway	$448,958	$1,133,869
Intel - U.S.	$2,764,085	$6,562,555

189. While this lump-sum calculation covers the accused units in this case sold to the Defendants for use in the U.S. ("Intel" in the above table), Intel would have likely negotiated for a lump-sum payment to cover all of their 802.11-compliant Wi-Fi chip components for sale in the U.S. (addressed in table above as "Intel-U.S.") or worldwide under Ericsson's RAND

obligation. Under the alternative situation of Intel negotiating a license that would cover all of its 802.11 products, the lump sum would be determined based on Intel's worldwide volume of 802.11 products from the first notice date through 2012 and project future volumes. Again, the lump sum would be determined based on two timeframes: (1) notice date through the end of 2014 (a five year term), and (2) notice date through expiration of the patents-in-suit in March 2020. It would also be determined based on three different royalty rates: (1) $0.004 per unit – the lowest end RAND royalty rate,[273] (2) $0.009 per unit –a mid-level RAND royalty rate, (3) $0.017 per unit – the upper bound RAND royalty rate,[274] and (4) $0.037 per unit – the extreme rate reflecting the absence of any apportionment.[275] These rates would result in the lump sums below:

Lump Sum for All Intel 802.11 Units Worldwide (2009 through 2014 or 2020)

	0.4 cents	0.9 cents	1.7 cents	3.7 cents
2014	$960,483	$2,161,087	$4,082,053	$8,884,469
2020	$2,512,434	$5,652,977	$10,677,845	$23,240,015

190. There are several additional factors relevant for this case that suggest that the illustrative rates for Ericsson's alleged 802.11 SEPs overstate the appropriate RAND royalty, including:

- Ericsson was not involved in the development of the 802.11 standard and made no technical contributions accepted into the standard it accuses. Ericsson had almost no participation in the development of 802.11 but focused on other technologies

[273] Expert Report of M. Ray Perryman, January 4, 2013, p. 99.
[274] Expert Report of M. Ray Perryman, January 4, 2013, p.98-99.
[275] Expert Report of M. Ray Perryman, January 4, 2013, p. 99.

like those for cellular technology and those related to the unsuccessful European wireless protocol, HiperLAN.

- A court in Germany found that European counterparts to two of Ericsson's alleged 802.11n patents do not cover the 802.11n standard.[276]
- Numerous patents relating to the 802.11 standards exist, and it is likely that many are believed to be essential. Intel has a large portfolio of well over 200 patents related to 802.11 according to third-party reports.
- The relatively low value of Ericsson's Patents-In-Suit especially in light of the existence of many alternatives as outlined by Dr. Shoemake.
- Wi-Fi chip components are largely undifferentiated products with significant price competition and very low profit margins. Very large volumes of unit sales are necessary in order for a chipmaker to achieve profitability. Additionally, a significant amount of research and development and other expenditures are required for companies in this market.

191. The market prices for Wi-Fi chip components have fallen rapidly and are projected to continue falling in the future.

192. In addition, in the case of a license to a chip component supplier such as Intel, it would be appropriate to discount for any existing license rights to Ericsson's alleged 802.11 SEPs held by that supplier's customers to avoid double taxation.[277] This phenomenon could, for example, be accounted for by a further reduction in any rate or fee owed by the supplier for a license to Ericsson's alleged 802.11 SEPs.

193. Furthermore, Ericsson has indicated that bilateral negotiations for a RAND royalty between two companies that both hold essential IPR for a standard should take into

[276] 75772DOC000736 (July 20, 2012, Order in Telefonaktiebolaget LM Ericsson v. Acer Computer GmbH, Regional Court of Mannheim); 75772DOC001242 (June 29, 2012, Order in Telefonaktiebolaget LM Ericsson v. Acer Computer GmbH, Regional Court of Mannheim). The third case from the Mannheim Court was stayed until the question of patent validity is ultimately ruled upon at the conclusion of separate "nullity" proceedings in Berlin.

[277] *For example, see* ERCDLINK0039162.

account the relative patent strength of the two companies.[278] In the event that a negotiated RAND license with Intel would include a cross license under Intel's 802.11 patents, the resulting negotiated royalty rate should be lower.[279]

194. Moreover, these rates reflect maximum amounts for a worldwide license, making all assumptions in Ericsson's favor. However, (1) Ericsson does not have patent coverage for its alleged 802.11 SEPs in many countries throughout the world; (2) Ericsson generally tends to focus its filings in a handful of countries (U.S., Japan, Germany, Australia, and sometimes China and Canada); and (3) Ericsson would otherwise not be entitled to seek or pursue damages for any alleged infringement in countries or regions where it does not have patent coverage or, for example, in countries such as Germany where portions of its portfolio have been adjudged not to cover the 802.11 standards. It would be appropriate, therefore, to further adjust any RAND rate downward to avoid a windfall to Ericsson from receiving royalties on products made or sold in countries where Ericsson has no corresponding IPR rights over the 802.11 standards. The rate could likely be adjusted downward by 10-20% or more to more appropriately reflect RAND terms.[280]

III. ERICSSON HAS VIOLATED ITS RAND COMMITMENTS

195. Membership in the IEEE obligates members to submit letters of assurance and to offer and grant licenses to claimed standard essential patents on RAND terms.

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[278] ERCDLINK0042852 at slide 11.

[279] Intel has numerous cross-license agreements which are for no royalties or result in royalty payments to Intel. *For example, see* Intel licenses with Broadcom Corporation (75756DOC000905); Extreme Networks, Inc. (75756DOC000711), Fujitsu Limited (75756DOC001157), Agere Systems Inc. and LSI Logic Corporation (75756DOC001088).

[280] Based on regional mobile PC unit market shares in 2009 for combined U.S., Europe, and Asia/Pacific regions. *See* Worldwide PC Market, Computer Industry Almanac Inc. & eTForecasts, January 2010, p. 124.

196. The policies and bylaws of the IEEE, Ericsson's membership in the IEEE, and Ericsson's LOAs confirmed Ericsson's obligations to license its allegedly essential patents on fair, reasonable, and nondiscriminatory terms. Ericsson is required to license all users and implementers of the 802.11 standard on RAND terms, including by making offers for a direct license to manufacturers of 802.11 Wi-Fi components like Defendant Intel for the manufacture, use, and sale of those components.

197. Ericsson has violated its RAND obligations in numerous ways including:

- Failing to apportion for the value of the discrete features allegedly covered by its patents;
- Demanding royalties against an improper end-product royalty base;
- Discriminating against chip suppliers and seeking commercially unsustainable royalty rates that, in aggregate, would exceed the price of Wi-Fi chipsets;
- Failing to account for the ex ante value of the accused features compared to alternatives available during the development of the standard and before lock in; and
- Pursuing injunctions without having made offers to license on RAND terms.

A. Absence of Apportionment

198. Ericsson fails to observe its RAND commitment by not properly apportioning the value of the technology of the Patents-In-Suit relative to the 802.11 standards and other technology embodied in the accused products. Ericsson has stated that a reasonable royalty rate needs to be set in proportion to a patent holder's contribution to a standard as well as the total amount of technology contained in a product.[281] However, Ericsson has not demonstrated any

[281] ERCDLINK0042852 (slides 8, 9); ERCDLINK0042959.

measurable economic benefit that can be attributed solely to the Patents-In-Suit, or its alleged portfolio generally. Even at the chip component level, the value of the Ericsson 802.11 patents should be properly apportioned to account for the intellectual property embodied in the chip component, including non-essential features and non-802.11 related features pertaining to silicon wafers, transistors, connections, clocking, oscillators, filters, metal layers, packaging, pins, memories, microcode and software features and tools, and many manufacturing process technologies.[282] Failure to do so would allow Ericsson to inefficiently extract royalties from innovative technology unrelated to its alleged SEPs, risk taxing the same functionality multiple times, and contravene the basic principle that the price of a patented technology should reflect the amount the free market is willing to pay for that technology.[283] "There are a number of theoretical and practical difficulties with judicial efforts to compensate for the existence of unpatented features of the invention."[284]

199. Ericsson's requested royalty rates are excessive given Ericsson's lack of contributions to the 802.11 standards alone, not to mention other technology in the chip components and devices.

B. Inappropriate Royalty Base

200. Ericsson's proposed 802.11n royalty rate relies on the price of the end user device as a royalty base. Defendants' accused products (other than Intel's) that allegedly embody the Patents-In-Suit (or Ericsson's alleged 802.11-essential portfolio) are downstream end

[282] Expert Report of Dr. Matthew Shoemake, January 4, 2013; Expert Report of Dr. Jerry Gibson, January 4, 2013.

[283] Lemley, Mark A., *Intellectual Property Rights and Standard-Setting Organizations*, California Law Review, Vol. 90 (2002), p. 2039 (75753DOC000292). For this reason, the price of and the margin earned on the device as a whole are irrelevant to valuing the patented feature.

[284] Lemley, Mark A. and Carl Shapiro, Patent Holdup and Royalty Stacking, *Texas Law Review*. Vol. 85 (2007), p. 2021 (75755DOC2497).

products that incorporate Wi-Fi chip components that provide functionality of the IEEE 802.11 standards.

201. Ericsson's end product royalty base is inappropriate considering the accused technologies are embodied within 802.11 Wi-Fi chips.[285] Furthermore, Ericsson is asserting the Patents-In-Suit against only a small portion of the features embodied in the Wi-Fi chip components.[286] Therefore, the royalty would most appropriately be measured on a base no higher than the Wi-Fi chip component level (the smallest saleable unit that incorporates the patented technology).[287]

202. Although the Wi-Fi chip component is a more appropriate royalty base, Ericsson contends that end user devices should be used as the royalty base.[288] The entire market value of a product can only be the base for a reasonable royalty, however, "where the patented feature creates the 'basis for customer demand' or 'substantially create[s] the value of the component parts.'"[289] Although it may be commercially important for suppliers of some end user devices to provide Wi-Fi functionality, that fact alone does not demonstrate that this feature (and certainly not the technology of Ericsson's alleged SEP portfolio) drives demand for the end user

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[285] Plaintiff's Responses to Defendants' Third Set of Common Interrogatories (Nos. 13-23), Interrogatory No. 21; Deposition of Gustav Brismark p. 629, 630; Deposition of Andreas Iwerbäck p. 178-179; Plaintiff Microsoft Corporation's Post-Trial Brief, *Microsoft Corporation v. Motorola Inc., et al.*, p. 12; January 4, 2013, Expert Report of Dr. Matthew Shoemake.

[286] January 4, 2013, Expert Report of Dr. Matthew Shoemake.

[287] Hovenkamp, Herbert J., Competition in Information Technologies: Standards-Essential Patents, Non-Practicing Entities and FRAND Bidding, University of Iowa Legal Studies Research Paper, No. 12-32, November 2012, p. 11-12 (75755DOC002216); *Microsoft Corp. v. Motorola, Inc*., No. C10-1823JLR, 2012 WL 5248439 at *8 (W.D. Wash Oct. 22, 2012) (noting that since the patent owner's "standard essential patents only relate to the 802.11 and H.264 capabilities, which in turn only constitute a portion of [the] end products … [i]t would … seem illogical to turn around and base a RAND royalty on the end product price.").

[288] Plaintiff's Responses to Defendant's Third Set of Common Interrogatories (Nos. 13-23), Interrogatory No. 21.

[289] *Uniloc USA, Inc. v. Microsoft Corp*., 632 F.3d 1292, 1318 (Fed. Cir. 2011).

product.[290] Ericsson presents no analysis as to the amount of damages if the royalty base is the Wi-Fi chip component.

C. Discrimination Against Chip Component Suppliers and Seeking Commercially Unsustainable Royalties

203. The non-discriminatory aspect of RAND licensing requires that no one will be refused an offer or a license. Ericsson is offering licenses on a discriminatory basis through its policy of licensing only at the end-product level. There is no basis for Ericsson's policy, which is further contrary to its LOA promises to license to an "unrestricted number" of companies.

204. The level of Ericsson's end-product royalties cannot, however, be applied to the Wi-Fi chipset, as those amounts would make the standard unviable and harm consumers. Ericsson's end-product royalty demands of $0.25-0.88 (which includes its reference rate of $0.50 / unit) suggests a possible cumulative per unit royalty of approximately $6-23 for users and implementers of the standard,[291] which is significantly greater than the market price of average Wi-Fi chip components that allegedly practice the patents, and far beyond the profits on those chip components.[292]

205. The 802.11 chip components are largely undifferentiated items with declining profit margins.[293] Suppliers do not have the option in such markets to merely raise prices to accommodate excessive royalties, as they are constrained by competitive forces and minimal

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290 For reference, see *LaserDynamics*, 694 F.3d at 67.

291 $0.50 / 0.039 = $12.82.

292 *See* Wi-Fi Chipset Evolution: From 802.11n to 802.11ac and 802.11ad, ABI Research, November 18, 2011.

293 Hachman, Mark, WiFi Becomes a Commodity, Extreme Tech, July 6, 2004, http://www.extremetech.com/extreme/56646-wifi-becomes-a-commodity (75753DOC003075); Wi-Fi Integrated Circuit Market, ABI Research, 2004, p. 5-13; Plaintiff Microsoft Corporation's Post-Trial Brief, *Microsoft Corporation v. Motorola Inc., et al.*, p. 12.

opportunity for product differentiation in the core 802.11 aspects of various products.[294] Wi-Fi chips are characterized by high-volume, low margin sales, with prices tending to fall over time despite added features. Hence, the market accommodates only a very modest overall royalty on these products, which must be shared by all patent holders relative to their contributions. Thus, it is economically disruptive and unsustainable for a single holder of a relatively minor segment of the underlying technology to demand royalties which are dramatically disproportionate to those determined by the market. Moreover, Intel's WLAN business for 802.11 products has struggled to reach profitability in a highly competitive market,[295] emphasizing the destabilizing effect that Ericsson's disproportionate royalties would have.

D. Failure to Analyze or Account For Ex Ante Value And Alternatives

206. In order to avoid hold-up, a royalty should be based on the *ex ante* value of a technology in that, otherwise, implementers of standards will be exposed to the very real threat of hold-up, especially when injunctions are permitted.[296] In particular, a royalty should reflect the *specific* benefits brought by the use of the patent arising from the incremental value generated by the patented technology potentially relative to the next-best non-infringing alternative.[297]

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294 ERCDLINK0011046.

295 Deposition of Alexander Quach, November 29, 2012, p. 60-63.

296 ERCDLINK0496236 at 244-249 (Expert Report of Carl Shapiro submitted in ITC Inv. No. 337-TA-576).

297 See, e.g., Mario Mariniello, Fair, Reasonable, and Non-Discriminatory (FRAND) Terms: A Challenge for Competition Authorities, forthcoming in *Journal of Competition Law and Economics*, p. 2, 10-11; Layne-Farrar, Anne, A. Jorge Padilla, and Richard Schmalensee, Pricing Patents for Licensing in Standard-Setting Organizations: Making Sense of FRAND Commitments, *Antitrust Law Journal*, Vol. 74, No. 3 (2007), p. 676; Farrell, Joseph, John Hayes, Carl Shapiro, and Theresa Sullivan, Standard Setting, Patents and Hold-Up, *Antitrust Law Journal*, Vol. 74, No. 3 (2007), p. 611-612; Daniel G. Swanson, Daniel G. and William J. Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust Law Journal*, Vol. 73, Issue 1 (2005), p. 23.

207. "Courts should cap the royalty at the incremental value of the patented technology over alternatives available at the time the standard was chosen" and should not award more than "the incremental value of the patented invention over the next-best alternative" when it can be determined. [298]

208. RAND requires that total royalties, covering all essential patents, must be "reasonable in the sense of being commercially viable, i.e., affordable."[299] Assessing royalties for a patent or portfolio without considering the royalties potentially due to other IP holders will likely result in unacceptably high total royalties.

209. RAND terms should be interpreted and RAND rates determined with an aim to prevent patent hold-up and royalty stacking problems.[300]

210. RAND and "reasonable rates" should be viewed on an *ex ante* rather an *ex post* basis.[301] *Ex ante* licensing terms reflect the true market value of the technology based on the

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[298] The Evolving IP Marketplace: Aligning Patent Notice and Remedies With Competition, Federal Trade Commission, March 7, 2011, http://www.ftc.gov/os/2011/03/110307port.pdf, p. 22, 23 (75755DOC001861).

[299] Response to Qualcomm, MCOI, ETSI GA/IPR06(06)12, September 6-7, 2006, p. 3.

[300] Swanson, Daniel G. and William J. Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust Law Journal*, Vol. 73, Issue 1 (2005), p. 8, 10-11 (75753DOC001993); Farrell, Joseph, Hayes, John, Shapiro, Carl, and Sullivan, Theresa, Standards Setting, Patents, and Hold-up, *Antitrust Law Journal*, Vol. 74, No.3 (2007), p. 636 (75753DOC005270); Miller, Joseph S, Standard Setting, Patents and Access Lock-In: RAND Licensing and Theory of the Firm, Indiana Law Review, Vol. 40 (2006), p. 357 (75753DOC000606); *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR, 2012 WL 2030098, *5–6 (W.D. Wash. June 6, 2012). Rapp, Richard T. and Lauren J. Stiroh, Standard Setting and Market Power, Joint Hearings of the United States Department of Justice and the Federal Trade Commission, Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy, Washington, D.C., August 18, 2002, p. 10 (75753DOC001673); Swanson, Daniel G. and William J. Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust Law Journal*, Vol. 73, Issue 1 (2005), p. 54 (75753DOC001993); Hovenkamp, Herbert J., Competition in Information Technologies: Standards-Essential Patents, Non-Practicing Entities and FRAND Bidding, University of Iowa Legal Studies Research Paper, No. 12-32, November 2012, p. 11-12 (75755DOC002216).

advantages of the patented technology relative to reasonable alternatives and prevent patent holders from exercising market power conveyed solely through standardization.[302] In particular, alternatives that were available at the time of standard setting should be examined since standardization, by design, minimizes or practically eliminates transition to alternatives once the standard is adopted and accepted in the market. Thus, irrespective of the number of declared essential patents held by an SEP holder, if the accused technologies offered only minimal incremental value over the alternatives available, that SEP holder is entitled to only a minimal royalty. Licensing fees determined by *ex post* leverage will tend to be "unreasonable," as they reflect sunk costs unrelated to the specific contributions of the patent.[303]

211. Non-discriminatory indicates, among other things, "at least a strong presumption that the terms given to a first licensee [provided they are fair and reasonable] will also apply to subsequent licensees."[304] A licensor could discriminate by offering more

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[301] For example, *see* The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition, Federal Trade Commission, March 2011, p. 22-23 (75755DOC001861). Ericsson has taken similar positions in the past. *See* 75755DOC001773, Telefonaktiebolaget LM Ericsson's Comments on the European Commission's White Paper on ICT Standardisation at 79 n.5; ERCDLINK0496236 at 52 (Expert Report of Carl Shapiro in ITC Inv. No. 337-TA-576).

[302] Miller, Joseph S., Standard Setting, Patents, and Access Lock-In: RAND Licensing and the Theory of the Firm, *Indiana Law Review*, Vol. 40, p. 355 (75753DOC000606); Swanson, Daniel G. and William J. Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust Law Journal*, Vol. 73, No. 1 (2005), p. 12 (75753DOC001993); Farrell, Joseph, John Hayes, Carl Shapiro, and Theresa Sullivan, Standard Setting, Patents, and Hold-Up, *Antitrust Law Journal*, Vol. 74, No. 3 (2007), p. 610 (75753DOC005270).

[303] Michel, Suzanne, Bargaining For Rand Royalties in the Shadow of Patent Remedies Law, *Antitrust Law Journal*, Vol. 77:889 (2011), p. 2; Hovenkamp, Herbert J., Competition in Information Technologies: Standards-Essential Patents, Non-Practicing Entities and FRAND Bidding, University of Iowa Legal Studies Research Paper, No. 12-32, November 2012, p. 11-12 (75755DOC002216).

[304] Hovenkamp, Herbert J., Competition in Information Technologies: Standards-Essential Patents, Non-Practicing Entities and FRAND Bidding, University of Iowa Legal Studies Research Paper, No. 12-32, November 2012, p. 8 (75755DOC002216); Joseph F. Wayland,

competitive pricing, for example, to a business partner or supplier. Also inherent in RAND is the idea that the patent holder is willing to offer licenses, and that no one will be refused an offer or a license. The royalty rate must remain reasonable no matter where in the supply chain it is collected and should only reflect the *ex ante* value contribution of the licensed technology. In addition, it would be inconsistent with SSO rules and objectives to refuse to offer RAND terms to those implementing the very technology set forth in the standard, especially to those that were materially involved in developing the standard.[305]

212. A RAND royalty should distinguish between the value conveyed from being selected for adoption into a standard and the intrinsic value contributed by technology alone.[306]

213. Ericsson has undertaken no analysis of *ex ante* value, and its end-product focused licensing practices and demands are more likely to reflect ex-post hold up. It relies on a handful of licenses with six companies that are alleged to include rights to Ericsson's alleged 802.11-essential patents, but in many cases, those licenses came years after the standard was adopted and years after the hypothetical negotiation. Nor are any of those licenses with Wi-Fi chip suppliers because Ericsson has pursued a policy of refusing to license at that level in the Wi-Fi product-distribution chain.

E. Ericsson's Requests for Injunctions Violates its RAND commitments

214. Ericsson's demand for an injunction against the Defendants in this case is also a violation of its RAND commitments. "Injunctions are inconsistent with FRAND" because "if

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Department of Justice, *Antitrust Policy in the Information Age: Protecting Innovation and Competition*, September 21, 2012, at *5-6, http://www.justice.gov/atr/public/speeches/287215.pdf. (75755DOC003283)

[305] Amicus Curiae Brief of the IEEE, *et al.*, In Support of Neither Party, *Apple, Inc. v. Motorola Mobility, Inc.*, Nos. 2012-1548, 2012-1549, (Fed. Cir. Dec. 19, 2012), p. 15-21, which describes that IEEE letters of assurance exist to protect against hold-up of implementers, and that implementers of the technology in the standard can enforce commitments in LOAs.

[306] Nelson, Philip B., Patent Pools: An Economic Assessment of Current Law and Policy, *Rutgers Law Journal*, Vol. 38:539, (2007), p. 545 (75753DOC000736).

patent owners refuse to license patents essential to the standard, the standard cannot be used."[307] Injunctions should therefore not be available for SEPs. [308]

215. Allowing injunctions undermines the FRAND commitment and serves no useful economic function."[309] Even the threat of an injunction is inconsistent with Ericsson's Letters of Assurance and skews licensing negotiations in Ericsson's favor as that introduces the risk of patent hold-up, especially after investments in the new technology have been made.

216. The threat of injunctive relief can be particularly harmful in the case of standardized technologies. RAND commitments within the standard setting process are typically used to avoid patent hold-up due to the market power conferred by a patent being incorporated into a standard. If an injunction is allowed for standards-essential patents, "[h]igh switching costs combined with the threat of an [injunction] could allow a patentee to obtain unreasonable

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[307] ERCDLINK0496236 at p. 17 (Expert Report of Carl Shapiro in ITC Inv. No. 337-TA-576); *see also* 75755DOC000047 (Ericsson motion in ITC Inv. No. 337-TA-577 arguing that "Respondents are estopped from pursuing the exclusionary remedies of the ITC" because they agreed to license their patents on FRAND terms); 75755DOC001559 at 4 (Order No. 21 in ITC Inv. No. 337-TA-577 characterizing Ericsson's position as being that "Ericsson's right to a FRAND license is a complete defense to complainants' demand for an exclusion order at the ITC" and noting that Ericsson argued that "Samsung cannot extinguish respondents' right to an irrevocable FRAND license by conditioning that right on demands for a cross-license …").

[308] *Apple, Inc. v. Motorola, Inc.*, 869 F. Supp. 2d at *915 (N.D. Ill. June 22, 2012) (Posner, J.) ("A FRAND royalty would provide all the relief to which Motorola would be entitled if it proved infringement of the '898 patent, and thus it is not entitled to an injunction."); *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR, 2012 WL 2030098, slip op. at 14 n.9 (W.D. Wash. Jun. 6,2012); *Microsoft Corp. v. Motorola, Inc.*, 696 F.3d 872 at 885 (9th Cir., Sep. 28, 2012) ("Implicit in such a sweeping [RAND] promise is, at least arguably, a guarantee that the patent-holder will not take steps to keep would-be users from using the patented material, such as seeking an injunction, but will instead proffer licenses consistent with the commitment made.")

[309] *See* ERCDLINK0496236 at p. 19 (Expert Report of Carl Shapiro in ITC Inv. No. 337-TA-576).

licensing terms despite its [F]RAND commitment, not because its invention is valuable, but because implementers are locked in to practicing the standard."[310]

217. The harms associated with injunctive relief in the standards context are not just from the imposition of an injunction, but the threat of an injunction. The threat of an injunction can have negative economic effects on competition.[311]

218. As Ericsson has not offered a license to Intel and other chip component suppliers on RAND terms, by its own position it should not be able to seek injunctive relief against at least those companies.

IV. BREACH OF CONTRACT

219. To determine breach of contract, the threshold issue for the Court is to ascertain which law applies to the alleged contracts at issue. *Apple, Inc. v. Motorola Mobility, Inc.*, 11-CV-178-BBC, 2011 WL 7324582 (W.D. Wis. June 7, 2011) (deciding summary judgment motion on breach of contract claims regarding RAND issues).

220. When the laws of two or more states may apply, the court must apply the choice of law rules of the forum state, which in this case is Texas. *Mayo v. Hartford Life Ins. Co.*, 354 F.3d 400, 403 (5th Cir. 2004) (citing *Klaxon Co. v. Stentor Elec. Mfg. Co.*, 313 U.S. 487, 496 (1941)). Where there is no conflict, the Court may apply the law of the forum state to resolve the dispute. *Mumblow v. Monroe Broad., Inc.*, 401 F.3d 616, 620 (5th Cir. 2005) ("if the laws of the states do not conflict, then no choice-of-law analysis is necessary, and we simply apply the law

[310] Analysis of Agreement Containing Consent Orders to Aid Public Comment, Federal Trade Commission, November 26, 2012, http://www.ftc.gov/os/caselist/1210081/121126boschanalysis.pdf, p. 5; Statement of Joseph F. Wayland Before the Committee on the Judiciary, United States Senate, Regarding Oversight of the Impact on Competition of Exclusion Orders to Enforce Standards-Essential Patents, July 11, 2012, http://www.judiciary.senate.gov/pdf/12-7-11WaylandTestimony.pdf, p. 4.

[311] Lemley, Mark A. and Carl Shapiro, Patent Holdup and Royalty Stacking, *Texas Law Review*. Vol. 85 (2007), p. 2008 (75755DOC002497).

of the forum state.") (quotations omitted) (quoting *Schneider Nat'l Transp. v. Ford Motor Co.*, 280 F.3d 532, 536 (5th Cir. 2002); W.R. Grace & Co. v. Cont'l Cas. Co., 896 F.2d 865, 874 (5th Cir. 1990)).

221. If a conflict exists, Texas directs courts to employ the "most significant relationship" test as stated in the Restatement. *Gutierrez v. Collins*, 583 S.W.2d 312, 318 (Tex. 1979) (adopting the methodology of the Restatement for application in determining choice of law for tort claims); *Duncan v. Cessna Aircraft Co.*, 665 S.W.2d 414, 420–21 (Tex. 1984) (applying the same methodology to contract claims); *see also Mayo*, 354 F.3d at 403 (stating that Texas courts use the "most significant relationship" test identified at §6 of the Restatement of Conflict of Laws for all cases in the absence of an applicable contractual choice-of-law provision);

222. Under the most significant relationship test, Texas courts assess the following factors: "(a) the needs of the interstate and international systems,(b) the relevant policies of the forum,(c) the relevant policies of other interested states and the relative interests of those states in the determination of the particular issue,(d) the protection of justified expectations,(e) the basic policies underlying the particular field of law,(f) certainty, predictability and uniformity of result, and(g) ease in the determination and application of the law to be applied."). Restatement (Second) of Conflict of Laws § 6.

223. Here, the potentially applicable laws are New York (where the IEEE resides), New Jersey (where the IEEE Standards Association is incorporated), California (where the majority of the Defendants reside) or Texas, where Ericsson and Dell reside. Because the relevant provisions of contract law from Texas are substantially similar to the provisions of the

other jurisdictions, no conflict exists and the Court may apply Texas law.[312] *Mumblow*, 401 F.3d at 620.

224. The policies and bylaws of the IEEE, Ericsson's membership in the IEEE, and Ericsson's LOAs committing to license its allegedly essential patents on fair, reasonable, and nondiscriminatory terms constituted a contractual agreement. *Apple, Inc. v. Motorola Mobility, Inc.*, 886 F. Supp. 2d 1061, 1083 (W.D. Wis. Aug. 10, 2012) ("In this case, the combination of the policies and bylaws of the standards-setting organizations, Motorola's membership in those organizations and Motorola's assurances that it would license its essential patents on fair, reasonable and nondiscriminatory terms constitute contractual agreements."); *Microsoft Corp. v. Motorola, Inc.*, No. 10–cv–1823–jlr, slip op. at 4–5 (W.D. Wash. May 31, 2011) (holding that Microsoft stated claim for breach of contract for Motorola's failure to offer licenses on fair, reasonable and non-discriminatory terms after promising it would do so to standards setting organization); *Research In Motion Ltd. v. Motorola, Inc.*, 644 F.Supp.2d 788, 797 (N.D. Tex. 2008) (holding at motion to dismiss stage that plaintiff stated breach of contract claim based on defendant's failure to offer fair, reasonable and non-discriminatory terms as it had promised European Telecommunications Standards Institute and Institute of Electrical and Electronics Engineers); *ESS Technology, Inc. v. PC–Tel, Inc.*, 1999 WL 33520483, *4 (N.D.Cal. Nov. 4, 1999) (holding that third-party beneficiary of contract between standards setting organization and defendant-essential-patent holder, software manufacturer had properly stated claim for

[312] A claim for breach of contract under California, New York and Texas law requires (1) a valid contract, (2) plaintiff's performance or excuse for nonperformance, (3) defendant's breach, and (4) damage to plaintiff. *See Wall Street Network, Ltd. v. New York Times Co.*, 164 Cal.App.4th 1171, 1178 (2008) (applying California law); *Nat'l Mkt. Share, Inc. v. Sterling Nat. Bank*, 392 F.3d 520, 525 (2d Cir. 2004) (applying New York law); and *Frost Nat'l Bank v. Burge*, 29 S.W.3d 580, 593 (Tex.App.-Houston [14th Dist.] 2000, no pet.) (applying Texas law).

specific performance of agreement requiring defendant to license patents on non-discriminatory and reasonable terms).

225. A member of a standard-setting organization enters a contract by, for example, accepting an obligation to offer fair, reasonable and non-discriminatory licenses under the intellectual property policies of those organizations.[313] *Apple*, 886 F. Supp. 2d 1061 at 1083; *Microsoft,* No. 10–cv–1823–jlr, slip op. at 4–5; *Research In Motion,* 644 F.Supp.2d at 797; *ESS Technology,* 1999 WL 33520483 at *4.

226. Defendants are parties to the contract with Ericsson or third-party beneficiaries to the contract between IEEE and Ericsson. *See, e.g., Apple*, 886 F. Supp. 2d at 1085; *Microsoft*, 864 F. Supp. 2d at 1032-33; *United States v. Allstate Ins. Co.*, 910 F.2d 1281, 1284 (5th Cir. 1990)

227. Ericsson's contract requires that it offer to license and license all users and implementers of the IEEE 802.11 standard under Ericsson's alleged 802.11-essential patents, including chipset suppliers like Intel.

228. Ericsson breached its contractual obligations in numerous ways, including those listed in Section III and by failing to offer licenses for its patents on fair, reasonable and non-discriminatory terms, by seeking to enjoin Intel's customers from making and selling products that include Intel components that operate in accordance with at least the IEEE standards, and by making royalty demands that would render the standard unviable and that are out of proportion to the value of its patented technology, if any, and its nonexistent contributions to the relevant standards.

[313] Ericsson has previously stated before this Court that licensing obligations absorbed from membership in standard setting organizations constitute contractual obligations. *See Ericsson Inc. v. Samsung Electronics, Co.*, 2007 WL 1202728, *1 (E.D.Tex. Apr. 20, 2007).

229. Defendants have been damaged by Ericsson's breach of its contractual obligations to offer fair, reasonable, and non-discriminatory licenses to all users and implementers of the IEEE 802.11 standard, and continue to be damaged by Ericsson's refusal to offer a fair, reasonable, and non-discriminatory royalty rate. Intel's customers have sought recovery and indemnification from Intel in this litigation.

230. Defendants are also entitled to specific performance, including without limitation an order that Ericsson comply with its obligation to license Defendants under Ericsson's alleged 802.11-essential patents on fair, reasonable, and non-discriminatory terms by, among other things, offering Defendants a license to its alleged 802.11-essential patents at a RAND rate between $0.004 and $0.017 per unit.

V. PROMISSORY ESTOPPEL[314]

231. Under Texas law,[315] the elements of promissory estoppel comprise of (1) a promise, (2) foreseeability of reliance by the promissor, and (3) substantial reliance by the promise to his detriment. *Harris Constr. Co., Ltd. v. GGP-Bridgeland, L.P.*, 698 F. Supp. 2d 723, 726 (citing *English v. Fischer*, 660 S.W.2d 521, 524 (Tex. 1983).

232. A patentee's letter of assurance ("LOA") to the IEEE creates an promise to license his essential patents on RAND terms. *See Microsoft Corp.*, 864 F. Supp. 2d at 1032; *Research In Motion*, 644 F. Supp. 2d at 797.

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[314] Defendants offer their promissory estoppel and breach of contract claims alternatively.

[315] As with breach of contract, the Court may apply Texas law because the elements for promissory estoppel are substantially the same between California, New York and Texas and thus there are no conflicts requiring resolution. *See, e.g., Kajima/Ray Wilson v. Los Angeles Cnty. Metro. Transp. Auth.*, 23 Cal.4th 305, 310 (2000) (elements of promissory estoppel under California law require are promise that a promissor should reasonably expect to induce action or forbearance on the part of the promise and does induce such action or forbearance); *Cyberchron Corp. v. Calldata Sys. Dev., Inc.*, 47 F.3d 39, 44 (2d. Cir. 1995) (elements of promissory estoppels under New York law are (1) a clear and unambiguous promise, (2) a reasonable and foreseeable reliance by the party to whom the promise is made, and (3) an injury sustained by the party asserting the estoppel by reason of the reliance.)

233. Ericsson, as a member of the IEEE that has submitted letters of assurance, has committed itself to license essential patents under RAND terms.

234. Ericsson asserts that its Patents-In-Suit are essential to the IEEE 802.11 standards.

235. Ericsson's promise requires that it offer to license and license all users and implementers of the IEEE 802.11 standard under Ericsson's alleged 802.11-essential patents, including chipset suppliers like Intel.

236. Ericsson breached its promises in numerous ways, including those listed in Section III by failing to offer licenses for its patents on fair, reasonable and non-discriminatory terms, by seeking to enjoin Intel's customers from making and selling products that include Intel components that operate in accordance with at least the IEEE standards, and by making royalty demands that would render the standard unviable and that are out of proportion to the value of its patented technology, if any, and its contribution to the relevant standards.

237. In reliance on Ericsson's commitment to license on RAND terms, Defendants invested significant resources in developing and producing 802.11 products. But not only has Ericsson refused to license its technology to chipmakers, it now seeks royalties that would harm the WiFi market and consumers.

238. To avoid injustice, equity requires that Ericsson be promissorily estopped from seeking or obtaining anything other than a license to its alleged 802.11-essential patents on anything other than reasonable and non-discriminatory terms.

239. To avoid injustice, equity requires that Ericsson be bound by its RAND obligations and be required to license its alleged 802.11-essential patents under reasonable, and

non-discriminatory terms by, among other things, offering Defendants a license to its alleged 802.11-essential patents at a RAND rate between $0.004 and $0.017 per unit.

VI. UNCLEAN HANDS

240. "[W]henever a party who, as actor, seeks to set the judicial machinery in motion and obtain some remedy, has violated conscience, or good faith, or other equitable principle, in his prior conduct, then the doors of the court will be shut against him in limine; the court will refuse to interfere on his behalf, to acknowledge his right, or to award him any remedy." *Keystone*, 290 U.S. at 245; *see Hazel-Atlas Glass Co. v. Hartford-Empire Co.*, 322 U.S. 238 (1944) (overruled on other grounds by *Standard Oil Co. v. United States*, 429 U.S. 17 (1976)); *see Precision Instrument Mfg. Co. v. Auto. Maint. Mach. Co.*, 324 U.S. 806 (1945).

241. A court has a wide range of discretion in refusing to aid the litigant with unclean hands. *See Precision*, 324 U.S. 806, 815 (1945).

242. Moreover, the doctrine of unclean hands is "not bound by formula or restrained by any limitation that tends to trammel the free and just exercise of discretion." *See Keystone*, 290 U.S. at 245-46.

243. Despite Ericsson's claims that its patents play an essential part of the 802.11n standard and has agreed to offer these patents on RAND terms, to this day, Ericsson has failed to abide by its RAND obligations and refuses to license to chipmakers on RAND terms.

244. Ericsson's royalty demands are unreasonable and excessive and will harm the Wi-Fi market and consumers. Ericsson has failed to offer licenses for its patents on fair, reasonable and non-discriminatory terms, sought to enjoin Intel's customers from making and selling products that include Intel components that operate in accordance with at least the IEEE standards, and made royalty demands that would render the standard unviable and that are out of

proportion to the value of its patented technology, if any, and its contribution to the relevant standards.

245. Due to its unclean hands, Ericsson is barred from enforcing its Patents-in-Suit and estopped from receiving any remedy for Defendants' alleged infringement. *See Keystone*, 290 U.S. at 245.

VII. LACHES

246. Laches may bar recovery where the plaintiff's delay was unreasonable and inexcusable and the defendant was prejudiced by the delay. *Rosemount, Inc. v. Beckman Instruments*, 727 F.2d 1540, 1550 (Fed. Cir. 1984) (patentee denied damages because of a three-year delay); *MCV, Inc. v. King-Seeley Thermos Co.*, 870 F.2d 1568, 1571-72 (Fed. Cir. 1989) (co-inventor's claim denied because of four-year delay to correct inventorship of asserted patent).

247. "The period from which delay is measured begins at the time the patentee knew, or in the exercise of reasonable diligence should have known, of the allegedly infringing activity." *Adelberg Labs., Inc. v. Miles, Inc.*, 921 F.2d 1267, 1270 (Fed. Cir. 1990).

248. Constructive knowledge arises when the defendant engages in "pervasive, open, and notorious activities" that a reasonable patentee would suspect were infringing its asserted patents. *Wanlass v. General Elec. Co.*, 148 F.3d 1334, 1338 (Fed. Cir. 1998).

249. Constructive knowledge may be imputed to the patentee if the patentee is negligently or willfully oblivious to potentially infringing activities when those activities are sufficiently prevalent in the patentee's field of invention. *Wanlass*, 148 F.3d at 1338 (Fed. Cir. 1998).

250. Material prejudice to the defendant may be either economic or evidentiary. *A. C. Aukerman Co. v. R. L. Chaides Construction Co.*, 960 F.2d 1020, 1033 (Fed. Cir. 1992).

251. "Economic prejudice may arise where a defendant and possibly others will suffer the loss of monetary investments or incur damages which likely would have been prevented by earlier suit." *Aukerman*, 960 F.2d at 1033.

252. Evidentiary, or "defense" prejudice, may arise by reason of a defendant's inability to present a full and fair defense on the merits due to the loss of records, the death of a witness, or the unreliability of memories of long past events, thereby undermining the court's ability to judge the facts. *Aukerman*, 960 F.2d at 1033.

253. The laches defense bars a patentee from recovering damages up to the time of suit. *Aukerman*, 960 F.2d at 1031.

254. Ericsson has admitted that it was aware of Intel's IEEE 802.11 compliant products at around the time they were introduced to the market. Intel introduced its first IEEE 802.11a compliant product in 2001. Ericsson has also admitted that it was aware of NETGEAR and D-Link's accused 802.11 products in 2004, and Acer's in 2007 or 2008. Ericsson has admitted that it was aware of Toshiba's products using 802.11 Wi-Fi chips at around the time they were introduced to the market. Because Ericsson did not file suit against Acer, Gateway, D-Link, and NETGEAR until 2010, against Dell, Toshiba, and Belkin until 2011, and against Intel until 2012, it unreasonably delayed bringing suit.

255. Moreover, as a result of Ericsson's inexcusable delay, Defendants have suffered economic prejudice because they were denied the opportunity to evaluate and promote alternatives, and avoid substantial investments in allegedly-infringing technologies.

256. Ericsson is precluded from obtaining damages from Acer, Gateway, D-Link, and NETGEAR prior to September 14, 2010, when it first asserted claims for infringement of the Patents-in-Suit.

257. Ericsson is precluded from obtaining damages from Toshiba, Dell, and Belkin prior to June 8, 2011, when it first asserted claims for infringement of the Patents-in-Suit.

258. Ericsson is precluded from obtaining damages from Intel prior to July 3, 2012 when it first asserted counterclaims for infringement of the Patents-In-Suit.

VIII. ERICSSON IS NOT ENTITLED TO AN INJUNCTION

259. Courts have historically applied a four-factor test to examine whether a permanent injunction is a suitable means of relief for patent infringement, a method which was recently affirmed by the Supreme Court in *eBay Inc. v. MercExchange, L.L.C.* in 2006.[316] In the four-factor test, "[a] plaintiff must demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction."[317]

260. According to the four-factor test, an injunction against Intel and the other Defendants would be inappropriate given the fact that Ericsson is not a competitor in this industry. Ericsson has not lost market share, revenue, or brand recognition. Therefore, no irreparable harm has been caused by the alleged infringement and any amounts owed, including interest, could simply be paid at the conclusion of this matter. Additionally, since Ericsson's intent prior to litigation was to license the technologies, monetary damages provide adequate relief for any infringement and therefore an injunction is not necessary in this case.[318]

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316 *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006).
317 *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391-92 (2006).
318 *Apple, Inc. v. Motorola, Inc.*, No. 1:11-cv-8540, 2012 U.S. Dist. LEXIS 89960 (N.D. Ill. June 22, 2012), p. 18.

261. An injunction is also an inappropriate form of relief according to the balance of hardships. Given that the inventions represent a miniscule portion of the overall operation of the accused devices, an injunction would constitute what Judge Richard Posner opines in *Apple, Inc. v. Motorola, Inc.* as "costs on the alleged infringer disproportionate both to the benefits to it of having infringed and to the harm to the victim of infringement, and would thus be a windfall to the patentee and a form of punitive rather than compensatory damages imposed on the infringer."[319]

262. Judge Posner further states that "[an] injunction that imposes greater costs on the defendant than it confers benefits on the plaintiff reduces net social welfare."[320] Since Ericsson does not make or design any 802.11 products that compete with the accused products, it would not gain any benefits from an injunction other than possible bargaining power with other potential licensees. Therefore, the costs of an injunction would far outweigh any possible benefits to Ericsson. Furthermore, in a concurring opinion in *eBay Inc. v. MercExchange, L.L.C.*, Justice Kennedy states that "[when] the patented invention is but a small component of the product the companies seek to produce and the threat of an injunction is employed simply for undue leverage in negotiations, legal damages may well be sufficient to compensate for the infringement and an injunction may not serve the public interest."[321] An injunction in this case would harm both Defendants and consumers by disallowing sales of the accused products far more than any relief to be gained by Ericsson by such an action.

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[319] *Apple, Inc. v. Motorola, Inc.*, No. 1:11-cv-8540, 2012 U.S. Dist. LEXIS 89960 (N.D. Ill. June 22, 2012), at *55-56.

[320] *Apple, Inc. v. Motorola, Inc.*, No. 1:11-cv-8540, 2012 U.S. Dist. LEXIS 89960 (N.D. Ill. June 22, 2012), at *70-71.

[321] *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 396-97 (2006).

263. The threat of injunctive relief can be particularly harmful in the case of standardized technologies because "[h]igh switching costs combined with the threat of an [injunction] could allow a patentee to obtain unreasonable licensing terms despite its [F]RAND commitment, not because its invention is valuable, but because implementers are locked in to practicing the standard."[322] Moreover, while Ericsson disputes the amount of its RAND obligation with the Defendants and maintains that it can refuse licenses to chip suppliers, its corporate designee on licensing testified that it would grant licenses today to the Defendants at $0.50/unit or 0.5% of the sales price of the end user device, and further that this amount would provide adequate compensation to Ericsson. This admission demonstrates that Ericsson can be compensated by money damages and cannot meet the test for injunctions set forth in *eBay*.[323]

CONCLUSION

264. Having reviewed the evidence and considered the testimony at trial, this Court concludes that Defendants have proven that Ericsson: (1) has breached its obligation to offer RAND licenses to Intel and the other Defendants at the RAND rate between $0.004 and $0.017 per unit; (2) is estopped from asserting the Patents-In-Suit and its other alleged 802.11-SEPs due to its failure to offer RAND licenses; (3) is barred by enforcing the Patents-In-Suit and its other alleged 802.11 SEPs due to its unclean hands; and (4) is precluded from obtaining damages prior to September 14, 2010 (from Acer, Gateway, D-Link, and NETGEAR), June 8, 2011 (from Toshiba, Dell, and Belkin), and July 3, 2012 (from Intel) due to laches.

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[322] Analysis of Agreement Containing Consent Orders to Aid Public Comment, Federal Trade Commission, November 26, 2012, http://www.ftc.gov/os/caselist/1210081/121126boschanalysis.pdf, p. 5.

[323] Deposition of Gustav Brismark, December 12, 2012, p. 514-516, 521, 555.

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CERTIFICATE OF SERVICE

I hereby certify that counsel of record who are deemed to have consented to electronic service are being served on May 9, 2013 with a copy of this document via the Court's CM/ECF system per Local Rule CV-5(a)(3).

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